DIMENSIONS OF INCOME INEQUALITY IN GREECE

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To my parents

ABSTRACT

This thesis investigated certain dimensions of inequality in Greece that have not or have only partially been explored so far, utilising the micro-data of a survey carried out in 1988 by the National Centre for Social Research. Reviewed were relevant studies conducted in the past, and evaluated were the available statistical data and information. Certain theoretical and methodological issues that one encounters when analysing and measuring inequality were also discussed. Initially, an analysis by income source was employed, which provided valuable information on the structure and profile of income inequality in Greece. The decomposition analysis by income components showed that entrepreneurial income is the most significant contributor to overall inequality in Greece, despite the fact that it represents a relatively small fraction of household income. Income taxes and social security contribution appeared to have a very weak distributional impact on overall inequality. This impact was explored further by employing regression analysis. It was found that the share of income tax and contributions is mainly related to wages and salaries. The most effective way to maximise their distributional impact is by eliminating tax evasion among the recipients of entrepreneurial income. The average household income was found to be greatly affected by certain population characteristics, and inequality appeared to vary substantially between population subgroups. The decomposition analysis showed that in all the population groups used, inequality between groups accounted for only a very small segment of the overall inequality. Finally, the hypothesis that, in Greece, the family background is a significant factor in determining the offspring's socio-economic status was tested. A loglinear analysis

was used in order to uncover all the potentially complex relationship among the variables employed. These results suggested that people face unequal opportunities for education and unequal probabilities of falling below the poverty line due to their family background.

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Needless to say, I claim full responsibility for all the contents of this Thesis.

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CHAPTER ONE

INTRODUCTION: OBJECTIVES AND PLAN OF THE STUDY

"The question whether the inequality of income is increasing or decreasing in modern communities is one of the most important questions in economics. Many writers have attempted to answer it, but their answers do not generally carry much conviction. To determine whether, under modern conditions, inequality tends to increase or decrease, involves the enumeration of a large number of distinct and conflicting tendencies and the weighing and balancing of them one against the other."
Hugh Dalton, 1920

1.1 Introduction

The aim of this study is to analyse income inequality in Greece. Greece, one of the poorest countries in the EU, has also a poor reputation concerning the availability of relevant data and statistics on economic and social inequality. This lack of available data has put serious limitations on the investigation and in-depth analysis of particular aspects of this issue. Indeed, until recently, studies on economic inequality in Greece were almost non-existent, and available information was generally very limited (see also Atkinson 1991). This, as also noted in a number of Commission Reports and

studies, had serious drawbacks for the design, evaluation, and monitoring of relevant National and EU policies.

Research interest in inequality and poverty appears to have fluctuated over time, following the performance of a number of other social and economic indicators. The issue of poverty and inequality had hardly attracted researchers' interest during the first two decades after the Second World War. The economy in most of the industrialised countries seemed to work rather well during the 1950s and 1960s. It was characterised by high rates of growth and low rates of unemployment and inflation. The need for government intervention in order to control the business cycle was generally acknowledged under the influence of Keynesian consensus. It was believed that governments had the necessary instruments and policies to guarantee these high rates of growth and to control the economic fluctuations. At the same time, it was conventional wisdom that income inequality and poverty would be reduced as a result of the continuous economic growth. Kuznets (1955), for example, using pre-tax income data from the UK and the US, supported that inequality tends to increase in the early stages of growth, but it declines in mature economies as the growth continues. Indeed, in a number of developed-industrialised countries during that period, poverty had declined rapidly and inequality was relatively stable. According to the estimates presented in Joseph Rowntree Foundation (1995) and Hills (1996) - based on income data from the Blue Book and IFS - inequality in the UK remained almost unchanged between the late 1940s and 1964, and then it was reduced until 1976/77. Similar was the picture in the US. The only difference was that inequality in the US reached its minimum in 1967/68 (Danziger and Gottschalk 1989, 1993, Karoly 1993). Thus the economic policy was mainly aiming at increasing the rate of growth,

which became the criterion of success. The strong belief that everybody would benefit more or less the same from growth, left the discussion on income distribution and, generally, inequality in the shadows. Furthermore, a number of researchers had reversed the question on inequality, presenting papers with titles such as: *"How Much More Equality Can We Afford?"* (Browning 1976). It was after the oil crisis of 1973 and the recession that followed that it was realised that the traditional instruments and policies of government intervention could not guarantee the continuing of growth and absorb the shocks or at least control the economic fluctuations. Inequality in the US had already started to increase and the UK followed in 1977. Although this rise in inequality was not a universal trend, it appeared to affect the majority of industrial countries. The oil crisis of 1973 renewed the interest in poverty and inequality. It became apparent that in developed western societies a large part of the population lived below a critical level, came to be known as poverty line. The war against poverty was launched in Europe, and in the 1980s it became one of the top priorities on the Commission's agenda for social affairs.

At first glance, the Greek experience does not seem to be much different from that of other countries. Nevertheless, looked at in a different light, there seem to be certain "peculiarities" as far as the Greek post-war economic and social development is concerned. The reader might find the following brief highlighting of the main characteristics and "peculiarities" of the economic and political development of the country helpful. She/he would need to be aware, though, that this presentation is quite elementary, since this is not the place to offer a comprehensive analysis of this issue.[1]

[1] For a more comprehensive survey into the development of the Greek economy, see Ioannidis and Mauroudeas (1999), Thomadakis (1997), Kintis (1995), Milios and Ioakeimoglou (1990), Vaitsos and Giannitsis (1987).

The presentation does, however, paint the picture of the general context within which the present study is situated, and in reference to which the data presented is rendered meaningful.

Greece's economy was totally destroyed at the end of the 1940s as a result of the Second World War and the Civil War that followed. It is generally agreed that during the first two post-war decades, the Greek economy witnessed particularly high rates of growth. As a number of macroeconomic indicators have suggested, during the period 1950-1973 the Greek economy was one of the fastest growing economies. The average annual rate of growth of GDP was among the highest in the world. Similarly, during the same period, the average annual increase of the productivity of labour was one of the highest in Europe. Although there is no sufficient evidence on the inequality trend during that period, it could be assumed that the living standard of the whole population was also increased.[2]

More precisely, in 1950 the agricultural sector represented 28.5% of GDP, while the relevant figure for the industrial sector was only 20.2% (see Vaitsos and Giannitsis 1987, p. 17). At the same time, the vast majority of the labour force (60%) were employed in the agricultural sector which was characterised by low productivity. During the 1950s, emphasis was placed in reconstructing the Greek economy, in recovering from the damages of the previous decade, and in developing the necessary infrastructure for further development of the country.[3] Despite the fact that

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[2] Karageorgas and Pakos (1986) argued that inequality increased during that period as a result of certain government policies for strengthening the capital accumulation in Greece (see also footnote 4).

[3] Vaitsos and Giannitsis (1987) argued that many of the characteristics of the current development of the Greek economy were rooted in certain choices in the social, economic and political field that took place during the first post-war period.

conservative governments were in power, the intervention of the state in the social and economic process was growing. This intervention was mainly aiming to create the appropriate environment for attracting foreign capital and investments, and to increase the capital accumulation and the industrialisation of the country (Ioannidis and Mauroudeas 1999, Karageorgas and Pakos 1986). The state also became particularly involved in investments to infrastructure, and in the financial system. In that period, the average annual growth of GDP and per capita GDP were 5.7% and 4.7% respectively (Vaitsos and Giannitsis 1987, p. 17).

During the period 1960-1973, the Greek economy grew even more rapidly. This period was characterised as the "golden age" of Greek capitalism (Milios and Ioakeimoglou 1990). The restructuring of the economy was completed and the position of the country in the world economy was upgraded (Ioannidis and Mauroudeas 1999). The average annual growth of GDP and per capita GDP was 7.7% and 7.1% respectively (OECD 1997a, p. 50). These rates were much higher than those observed in other European countries, and only Japan among the OECD countries appeared to perform better. At that time, exports of goods and services were increasing annually by 12.6% (OECD 1977a, p. 61). Similarly, high rates were observed in the average annual growth of investments and industrial productivity. During the same period, productivity was increasing annually by 8.2% and real wages by 5.5% (see Georgakopoulos 1995, p. 117).[4] Greece's economy had been restructured in favour of the industrial sector. By the end of this period, the share of the agricultural sector in GDP was decreased to 15.6%, while the relevant figure for

[4] Karageorgas and Pakos (1986) also argued that during the first post-war period (1950-1973) the government policy aimed to keep the rate of increase of wages and salaries lower than the rate of growth of productivity. This was done in order to increase the profitability and the international competitiveness, and to attract investments in the industrial sector.

the industrial sector increased to 34.7% (see Lianos and Lazaris 1995, p. 73). The share of services in GDP remained more or less constant (at around 50%) during the above period. On the other hand, unemployment rates remained well above the relevant average figures for EU and OECD countries (Thomadakis 1997). This, alongside with the surplus labour in the agricultural sector, contributed to the massive emigration that took place during that period. Overall, it was estimated that more than one million workers emigrated between 1950 and 1973. Additionally, the high concentration of the population in large urban areas that the country witnessed during that same period can be attributed to the same causes. As Petmesidou (1996) argued, *"...external (as well as internal) emigration was the only policy measure put forward by governmental and state agencies for dealing with problems of poverty, unemployment and social unrest"* (p. 325).

In the political arena, conservative governments dominated as a result of the defeat of the Lefts during the Civil War. Despite the fact that the political system enjoyed the title of Parliamentary Democracy, civil liberties were restricted and political expression was oppressed. The anticommunist character of the post Civil War state was discriminatory in favour of the victors.[5] The Communist party was outlawed and a large number of left-wings and democrats were sent to exile or had to flee the country. At the same time, the aid received in the 1950s by the US through the Marshal Plan for the reconstruction of the economy, increased the economic and political dependency of Greece. That period was also marked by two events. The first was the agreement of 1961, which opened the way for Greece to join the European

[5] For example, a number of state policies and actions were aiming to exclude those belonging to the losing side in the Civil War and those with certain political views from a number of public services and from employment in the public or other state controlled sectors (Diamandouros 1997).

Community, and the second was the military coup d'etat in 1967, which established a dictatorship in Greece that collapsed seven years later. During these critical years of the military authoritarian regime, civil and political liberties were further oppressed.

It was after the oil crisis of 1973 that the economic and political character of the country changed considerably. Additionally, Turkey's invasion in Cyprus in 1974 and the collapse of the military dictatorship during the same year marked the beginning of this new era. Greece witnessed a slowing down of the growth rates of GDP and a high inflation. In particular, the inflation rates rose from 5% in 1972 to 27% in 1974, while total production was decreased by 3.6%. The average annual rate of inflation during the whole period of 1973-1979 was 16.1%, increased to 21. 8% during the period 1979-1984 and was above 17% for the period 1984-1993 (see Thomadakis 1997, p. 46). Only in the very recent years have inflation rates been reduced significantly and have fallen below 5%. The annual average GDP growth rates were reduced to 3.7% in the period 1973-1979, and since then they have remained particularly low, fluctuating over time. Between 1980 and 1995, the growth rate of GDP in Greece was lower than the relevant average figure for the fifteen EU countries (see OECD 1997a). During that same period, unemployment was first decreased considerably until 1979, and, since then, it has increased and has reached the average figures of the other fifteen EU countries in the mid 1990s (see Georgakopoulos 1995, Thomadakis 1997). Of course, one event that has considerably affected the economic and political changes in the country was the fact that in 1981 Greece became a member of the EU.

In contrast to the performance of the economy, significant positive changes have taken place in the political process since 1974. A major achievement was the

strengthening of democracy and the establishment of a political system that guaranteed stable governments and constitutional order. Thomadakis (1997) has named this period the "second miracle", the first being the economic growth during the period 1960-1973. During the period 1974-1981, the conservative party of New Democracy was in power, having won two elections. In 1981, the Panhellenic Socialist Movement (PASOK) came into power.[6] Since then, it has won most of the elections and has governed the country, except for the period 1989-1993.[7]

The development of the Greek welfare state did not follow the trend of the other domestic macroeconomic indicators, as it happened in most European countries. During the period of the high rates of growth, welfare policies were rudimentary and hardly any political debates over the issue of welfare state took place.[8] The political oppression that Greece experienced until 1974 resulted also in a constant repression of any demands coming from the low income strata for distributional policies (such as wage and income increase, social provisions to those in need and so on) (Karageorgas and Pakos 1986, Petmesidou 1991). Therefore, during that period, there were no specific policy measures aiming to alleviate income inequality. The only noticeable legislation introduced in the social policy area concerned certain tax and family allowances with doubtful distributional effects (Iatridis 1979, Petmesidou 1991).

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[6] Following PASOK's election, parts of the population that had been excluded in the past, and particularly during the first two post-civil war decades, were integrated into the political system (Diamantouros 1997).

[7] During the period between June 1989 and April 1990, two governments came into power; one consisted of a coalition between New Democracy and other Left and Democratic parties, and the second was an all-party government. The party of New Democracy won the national election in 1990 and stayed in power until 1993.

[8] A more in-depth analysis on the development of the welfare state and social policy in Greece is presented in Petmesidou (1991) and (1996), Riga (1993), Rompolis (1991), and Katrougalos (1996).

It was after the mid 1970s, and during the stagnation, that Greece experienced an increase in public spending in social provisions. In particular, during the 1980s there was a rapid expansion of public expenditures, and some significant legislation in the social policy sphere was introduced, following PASOK's rhetoric for social and political reforms (Petmesidou 1991, 1996).[9] The proportion of total outlays of government as a percentage of GDP increased from 17.4% in 1960 to 43.7% in 1985 and to 52.1% in 1995 (OECD 1997a, p. 72). Despite the fact that the share of GDP that social expenditures represented was also increased during that period, it remained significantly lower than the relevant figures for other EU countries and the average figures for OECD countries. The annual growth of social expenditure per capita was particularly high during the first half of the 1980s, showing a faster growth than the relevant average figures for the twelve EU countries. Since the mid 1980s, the rate of growth of social expenditure per capita was reduced and in the early 1990s it became negative (see Petmesidou 1996). In the mid 1990s, social security expenditure represented 23% of GDP, a figure which was among the lowest for OECD countries (OECD 1997b). Social security transfers, as a percentage of GDP, increased from 5.3% in 1960, to 7.1% in 1974, to 14.8% in 1985 and to 16.9% in 1995 (OECD 1997a, p. 71). To this it should be added that the unemployment rate during the 1960s was considerably low and it increased steadily from 2.1% in 1974 to 10% in 1995 (OECD 1997a, p. 45). Pensions and health care alone represented more than 90% of the total social security expenditure. By the end of the 1980s, public expenditures in education, health and unemployment benefits, as percentages of GDP, were well

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Information on various aspects of this issue are provided also in Yfantopoulos (1990), Getimis and Gravaris (1993), Sissouras and Amitsis (1994), OECD (1997b).

[9] Among these reforms were the establishment of a national health system, the founding of the open-care centres for the elderly (KAPI) and the introduction of a system of means tested public pensions for those elderly with no other means of support, which is not associated to certain contributions made by the entitlement in the past (see Petmesidou 1996).

below the average figures for OECD and EU countries. Despite the fact that the total public health expenditure as a proportion of GDP increased from only 2.7% in 1981 to 4.9% in 1996, it was still bellow the relevant average figure for EU countries (OECD 1997b, p. 104). The system of social security remains highly segmented, since it contains more than 300 social security funds covering 90% of the population (see Petmesidou 1991, Riga 1993, OECD 1997b). These funds are mainly financed by contributions paid by employers and employees. In the early 1980s, during the first PASOK government, there was a significant increase in expenditures on pensions, which exceeded the average figure for OECD countries.[10] Additionally, the automatic indexation scheme (ATA) was introduced, which linked earnings and pensions with inflation rates. At the time, these measures seemed promising for achieving certain redistributive goals based on social needs. However, the distributional effect of these measures has been questioned. It seems that the effect has been limited to those working in the public sector. Furthermore, in the mid 1980s, within the framework of the stabilisation programme, a Bill passed that prohibited any increase in wages and salaries beyond ATA. As Petmesidou (1991) argued, the application of this law to the private sector negatively affected the collective bargaining for wages increase, while, at the same time, the state often discriminated in favour of certain sections of the public sector with traditionally strong trade unions.

However, despite the rapid increase in government expenditures, the welfare state in Greece remained highly fragmented and rudimentary, and the various social provisions and services continued to be uncoordinated if not chaotic. Petmesidou (1991) and Katrougalos (1996) have conveyed some of the essential features of the

[10] The expenditure on pensions was below 6% of GDP in the mid 1970s, but exceeded 12% in 1990

development and the "peculiarity" of the Greek welfare state. They have claimed that these are rooted in the lack of a consensus among population strata on the aims of social and economic development, as well as in the competition among them for access to political power.[11] No consensus among middle classes on the distributional goals of social provision on a basis of need was ever achieved. Ferrera (1996), places the Greek welfare state in the "Southern Model", which is characterised as "particularistic-clientelistic".[12] Also, Gough et al (1997), in their typologies of social assistant regimes, placed Greece in the group of countries with "rudimentary assistance" (see also Gough 1996). The importance of social assistance within the Greek social security system is particularly limited, and there is lack of any general safety net scheme (Karantinos et al 1990, 1992, Gough 1996). At the turn of the 20th century, the family in Greece still remains an important provider-substitute for a number of welfare provisions, and retains its functional role as the basic unit for decisions that concern the welfare of its members (Tsoukalas 1986a, Petmesidou 1996, Symeonidou 1997).

As already noted, the mid 1970s were a milestone in reviving the world's interest in social and economic inequality. During that same period, poverty and inequality became the focus of strong political debates. Stating the intention to alleviate poverty and, generally, social and economic inequality has often become an essential

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(OECD 1997b, p. 78).

[11] Petmesidou (1991) emphasises the relation between the state and the civil society, in order to elucidate the development of social policy in Greece. She explains the lack of consensus as a result of the competition among middle classes for political power and economic gains. Katrougalos (1996) argued that the lack of consensus among social actors is rooted in the "dual society" that emerged in the first two decades after the Civil War.

[12] Ferrera (1996) pointed out that in the Southern European welfare states, welfare rights *"....rest on a closer, particularistic culture and on a 'soft' state apparatus, both still highly imputed with the logic of patron-client relationships which has been a historical constant in this area of Europe"* (p. 29).

ingredient of the rhetoric and declarations of the political parties (see Tsakloglou 1988). Research interest in inequality issues was also strengthened by the growing concern about poverty, which the European Community showed during that time. Indeed, in the mid 1970s, the First European Programme to Combat Poverty was launched and the social dimension of the Community began to play a more prominent part.[13] Simultaneously, it was more widely recognised that there was a need for more active policies that would strengthen the efficient functioning of the Single European Market, and would – at the same time – compensate for any social dislocations caused by it (Room 1990, 1991). It is thus indicative that since the mid 1970s, and particularly during the 1980s, at a time when the evidence available suggested that poverty was increasing among EU member states, the Commission of the EU (then EC) strongly suggested that states need to produce comparative statistics and information on income inequality and poverty, and on the adequacy of their social policies. This would help the Commission to monitor its actions and evaluate National and EU policies (see Room 1987, 1990, Riga 1992).

It is broadly accepted that accurate and comparable estimates on economic inequality are crucial to policy makers. They could play a significant role in identifying priorities in the allocation of funds and in evaluating the success of alternative policies. This is particularly important within the EU, considering that the member states have different social structures, different degrees of development, and different welfare systems (Room 1990, Espin-Andersen 1990, Ferrera 1996). This information has to be taken into account in designing, implementing and evaluating National or EU policies. Of course, the motives behind the emphasis placed by the Commission in

[13] It has to be mentioned that Greece did not actually participate in the First European Anti-Poverty

research and action programmes on poverty and inequality has often been questioned (Cram 1991, Riga 1992). No matter what the motives were, what needs to be acknowledged is that the European Anti-Poverty Programmes, and the relevant emergent debate, put pressure on Greece to increase the volume of research into issues related to income inequality, poverty and the adequacy of social policy, partly in order for the country to take advantage of the availability of EU resources (Petmesidou 1991).

1.2 Objectives

The main objective of this study is to systematically analyse income inequality in Greece, using a more comprehensive and appropriate database than those used by relevant studies in the past. In addition, it aims to investigate particular dimensions of the inequality which have not (or have only partially) been explored so far, and to provide accurate estimates, suitable also for comparative purposes. Finally, it aims to evaluate the distributional impact of certain tax and social policy measures, and to provide information that would help design more effective policy interventions.

The specific aims of the present study are the following:

- To describe and analyse the structure of the distribution of income in Greece. The target is to draw the profile of inequality in Greece, to identify the characteristics of various income groups, and to investigate which personal attributes and social

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Programme.

characteristics directly or indirectly affect the distribution of income and how. The principal question that is sought to be answered concerns the extent to which certain differences between population subgroups could explain the overall inequality. Emphasis is placed not only in the distribution of total income, but also in its structure, as well as in the distribution of various income components. For this reason, a decomposition analysis of inequality by income components and by population subgroups is employed.

- To evaluate the distributional effect of Government policies and interventions, particularly through income taxation and social security contributions, as well as social security provisions. The effect of these policies on inequality is investigated not only in relation to the total household income, but also in relation to certain social characteristics and the main income sources. This will provide a clearer picture as to "who pays - who benefits", and will enable a more effective evaluation and monitoring of the relevant policies in this area.

- To introduce a more dynamic approach in analysing inequality in Greece, by exploring certain intergenerational consequences. Tested is the hypothesis that, in Greece, the family background is a significant factor in determining the offspring's socio-economic status. The issue of intergenerational patterns of inequality has attracted hardly any research interest in Greece.

- To utilise the data of a special survey conducted by the National Centre for Social Research, the aim of which was to collect information on economic and social inequality in Greece. By the time the present study was conducted, only limited

use had been made of this data. Emphasis is placed in providing accurate estimates and summary measures, which will not be subject to certain drawbacks as other studies in the past were, and which will not confine the analysis within the boundaries of a national context only, but will allow potential cross national comparisons. Furthermore, the effect of alternative concepts and variable definitions in the inequality exercise will be discussed, and certain assumptions will be tested.

- Finally, to provide information that will improve our ability to evaluate and predict the influences of certain policies and interventions, will help define target groups more accurately, and will identify priorities in the allocation of funds.

1.3 Plan of the Study

The present thesis is organised in the following way: Chapter 2 reviews some of the most significant studies in the field of economic inequality in Greece, and evaluates available statistics and data sets. The studies reviewed are classified in three main categories: studies based on data from Family Expenditure Surveys (FES), studies based on data from Tax Returns (TR), and studies conducted by the National Centre for Social Research (EKKE). Pointed out are the scarcity and the limitations of the data and the statistical information available in Greece for analysing economic and social inequality. Some main findings of existing studies are discussed, certain of these studies' drawbacks are mapped out, and particular aspects of inequality that were never or were only partially investigated up to date are presented. Commentary

on these topics provides the necessary framework for defining the objectives and for highlighting the contributions of the present study.

Chapter 3 clarifies some of the theoretical and methodological issues that one encounters when analysing and measuring economic inequality. The extent to which these issues are discussed is determined by the direct relevance they have to the aims of the present study. Thus the theoretical issues discussed address mainly the meaning of inequality. The main question driving this section is whether we could have a value free concept of inequality. The methodological issues discussed address certain conceptual matters and alternative definitions arising in the empirical investigation, such as that of the economic variable, the demographic unit and others. The potential effect of using alternative concepts and variable definitions in the assessment of inequality is also examined. Overall, the critical review in this chapter aims to justify the objectives, as well as the methodology adopted in the present study, as described in the chapters that follow.

Chapter 4 presents the data used in the present study, that derives from a survey conducted by EKKE. Information is provided concerning the objectives and the particular methodology employed (sample, tools etc). Discussed are particular methodological issues related to the concepts and the variable definitions adopted. Information is also given on the calculation of the relevant variables, under the restrictions imposed by the limitations of the data used. Presented are also the methodological problems faced in accessing the original database, and described is the work done to organise and clean the original raw data. The present study is contrasted to other similar studies in the field and differences are pointed out.

Chapter 5 analyses the distribution of household income in Greece, according to its main sources. Detailed information is provided on the distribution of total household income, on its structure, and on the distribution of various income components. One of the issues that this chapter also investigates is the sensitivity of the results to the measure of income used in assessing inequality in Greece. Emphasis is placed in investigating income inequality, employing a decomposition analysis of inequality by income source. This analysis offers additional valuable information for examining further the observed inequality in Greece, and allows one to evaluate and predict the effects of certain government policies. No similar research had been conducted in Greece prior to this study.

Analysis in Chapter 6 aims to shed more light on the distributional impact of income taxes and social security contributions. The main question posed is whether and to what extent the income taxes and the social security contributions achieve their distributional goals. The association between the taxes and social security contributions that households pay and a number of variables that are thought to influence this percentage is investigated. Scatterplots and regression analysis are employed to explore the nature of these associations and to increase the depth of this investigation.

Chapter 7 looks into the distribution of household income according to the main social and demographic characteristics of the household. Answers are sought as to the extent to which certain social characteristics and personal attributes could help explain income inequality in Greece. This analysis is quite revealing for understanding and

explaining income differences among the population subgroups. The degree to which overall inequality is attributable to inequality between these subgroups or to inequality within them is investigated, employing a decomposition analysis by population subgroups. In Greece, only limited research has been so far conducted in this area.

Chapter 8 analyses inequality in Greece by examining the relationship between family background and household economic status. The idea supported is that the study of inequality and poverty needs to be approached in a fashion that is more dynamic than the ones usually adopted. Thus the hypothesis put forward in this chapter is that the family background, and - in particular - parental socioeconomic status, is a significant factor in determining the offspring's opportunities for training and accessing the labour market, and for their future socioeconomic status in general. Therefore, a further hypothesis, that the socioeconomic status of the parents is associated with the probability of their children falling below or above the poverty line, is examined. Within this hypothesis, education is considered a crucial vehicle transferring inequality to the next generation. Loglinear analysis is employed in order to uncover all the potentially complex relationships among the variables used.

Finally, Chapter 9 presents a concise summary of the principal findings of this study in connection to its aims, and reviews the main conclusions. It also offers some notes on various policy implications pointed out throughout this thesis, and delineates certain areas for future research.

CHAPTER TWO

STUDIES ON ECONOMIC INEQUALITY IN GREECE AND EVALUATION OF AVAILABLE STATISTICS

2.1 Introduction

This chapter reviews some of the most significant studies on economic inequality in Greece and evaluates the available statistics and relevant data sets.

Information and data sets on economic inequalities are provided mainly by the Family Expenditure Surveys, Tax Returns, Labour Force Surveys, National Accounts, Social Security records and so on. These data sets are collected as a by-product of some administrative function and this is the main reason why they are considered rather insufficient in analysing economic inequality. Therefore, the information provided by these data sets is often used under heroic assumptions by researchers in the field in order to investigate particular aspects of inequality. Additionally, the limited information that the existing data sets provide put significant barriers on the number of issues that can be investigated, in relation to social and economic inequalities in Greece.

The vast majority of the relevant studies on inequality and poverty in Greece are based on Family Expenditure Surveys (FES) and Tax Returns (TR). Both databases are conducted by the National Statistical Service of Greece (NSSG). Other data sets such as the National Accounts, Labour Force Surveys, Social Security Records and others have also been used in order to provide additional and/or more accurate estimates in the investigation of particular aspects of the issue (Karageorgas 1973, 1977, Mourgos 1980, Athanassiou 1984).

The FESs are not conducted frequently and comparable published data sets for the total country can be found only in the 1974, 1981/82, 1987/88 and (recently available) 1993/94 FESs. Furthermore, they fail to provide reliable estimates of household income and for this reason NSSG publishes only the consumption expenditure data sets. Nevertheless, FESs are the only reliable source of published data on consumption expenditure and a valuable source of information on a number of other social characteristics of the population. Therefore, they have been the most frequently used source of data for the studies on inequality and poverty in Greece since the early 1980s.

Statistics of declared income (Tax Returns) are generally considered as a rather problematic and unreliable source of information in analysing social and economic inequality in Greece. Low coverage of the working population and tax evasion in Greece result to a significant underestimation of household income (Lianos and Prodromidis 1974, Livada 1988). Thus in 1975 the household income appeared to represent only 29.9% of the relevant figure of National Accounts (Kanellopoulos 1986).

As a result of the problems related to the lack of sufficient information, most of the relevant studies fail to give a clear picture of economic inequality in Greece. Furthermore, the estimates provided by these studies are rather unsuitable for comparative purposes.

During the 1980s two important sample surveys, specially designed to analyse income inequality and poverty in Greece, were conducted by the National Centre for Social Research (EKKE); one in 1985 and the other in 1988. The results of both surveys published so far concern mainly the Greater Athens area (Karageorgas et al 1988, Fetsi 1990, Ketsetzopoulou 1990, Balourdos et al 1990). Unfortunately, with the exception of some limited distributions and summary statistics on household income, provided by the 1988 sample survey, accurate and detailed results for the whole country are not yet available (Yfantopoulos et al 1989, Deleeck et al 1991, Papatheodorou 1992).

In the following section, a brief account of the most significant studies on economic inequalities in Greece will be given. The relevant estimates and summary statistics provided by these studies were largely influenced by the database they used. Similarly, the number of issues and the aspects of inequality that were investigated were also restricted by the particular data sources. Therefore, these studies are presented classified in three main categories according to the main source of data used.[1] These are:

- studies based on FES
- studies based on data from Tax Returns (TR)
- studies conducted by EKKE

[1] This classification was also used in Papatheodorou (1992). Tsakloglou and Mitrakos (1998) adopted a classification in presenting the studies of inequality in Greece which is similar.

In the following section, an evaluation of the relevant data sources used will also be presented.

2.2 Family Expenditure Surveys

As mentioned, Family Expenditure Surveys (FES) are conducted by the National Statistical Service of Greece (NSSG). They provide sufficient information on household consumption expenditure and on a number of social and demographic characteristics.

The first FES was carried out during the period April 1957 - March 1958 and covered only the urban areas in Greece (NSSG 1961).[2] The immediate objective of this survey was to provide reliable estimates on household consumption patterns in order to construct the first official consumer price index. Being aware of the lack of official statistics in Greece, they decided to widen the objectives and thus also the information collected by this survey. Therefore, additional information on a number of social, demographic and economic characteristics of the population, as well as on household cash income were also collected. The sampling size was 2,830 and it covered 93% of the population of the urban areas, based on the 1951 Population Census. Overall, 262 households refused to or were unable to collaborate with this survey giving a non-response rate of 9.3% (Table 2.1).[3] This survey was repeated in the following years but in a smaller scale.

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[2] The definition of urban areas was cities of 10,000 inhabitants and over, based on the 1951 Population Census.

[3] The non-response rates in all Greek FES surveys (with the exception of the 1993/94 survey) appear

TABLE 2.1: Large Scale Family Expenditure Surveys in Greece

PERIOD	COVERED REGIONS	POPULATION COVERAGE (%)	SAMPLING SIZE	HOUSEHOLDS INTERVIEWED	SAMPLE FRACTION	NON RESPONSE RATES (%)
1957/58	Urban Areas	93 (of Urban Areas)	2830	2568	1/1500	9,3
1963/64	Semi-Urban & Rural Areas	Not Available	3755	3748	1/303	0.16*
1974	Total Country	96	7497	7424	3/1000	13.4**
1981/82	Total Country	97	6088	6035	2/1000	12.6**
1987/88	Total Country	97	6523	6489	2/1000	14.5**
1993/94	Total Country	97	6831	6756	2/1000	24.5**

* According to NSSG (1969), only 7 households refused to participate in the 1964/64 survey and were replaced by others.

** These figures correspond to the initial rate of denials and absences. In these surveys those households that refused to participate, were absent or unobtainable were finally replaced by others (usually neighbouring) households.

Source: NSSG (1961, 1969, 1977, 1986, 1990). Information for the 1993/94 survey is provisional since the relevant official documentation had not been produced by the time of the present study (NSSG forthcoming).

Another large scale FES was carried out in 1963/64 and covered only the semi-urban and rural areas (NSSG 1969). It was considered to be a continuation and a supplement of the 1957/58 survey. The sampling fraction was 1/303 on semi-urban and rural households of the country and the sampling size was 3,755.

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significantly low in comparison to other countries. Thus the non-response rate for the 1977 British FES

During the period 1962/63 to 1968/69 a number of small scale FESs were carried out covering only the cities with a population of 30,000 inhabitants and over. At the time, these cities constituted about 75% of the urban population of the country. The sampling fraction was 1/1500 and was based on the 1961 Population Census (NSSG 1972).

The first large scale FES that covered the entire population of the country was conducted in 1974. The sampling size was 7,497 households and the sampling fraction 3/1000 based on the 1971 Population Census (NSSG 1977). This is considered rather large in comparison to the sampling fraction of the FESs in other countries (Wahab 1980). The population coverage was 96%. Initially, 955 households refused or were unable to collaborate to this survey. These households were finally replaced by others.

Three other surveys that followed, namely the 1981/82, the 1987/88, and the 1993/94 FESs, also covered the entire population of the country. The sampling size was smaller than the 1974 FES. The non-response rate of the 1993/94 survey appeared significantly higher than the others (Table 2.1). In the last survey households were asked to make an evaluation of their financial position (the results of the 1993/94 FES have only recently been available but the official documentation has not yet been published).

FESs were based on multi-staged stratified random samples. Information was collected by specialised interviewers. Two types of questionnaires were used. One contained information on demographic and employment characteristics of the household members and the other on general expenditure of the household.

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was higher than 30% (Kemsley et al. 1980, Atkinson and Micklewright 1983).

The unit of analysis in these surveys was the household, and its definition was similar to the one given in the United Nations (1977) guidelines. Thus the definition given to a household was that of a group of persons sharing the same dwelling and having common arrangements of meals, or that of a single person living on his/her own in a dwelling or living with other persons but having no common arrangements for the provision of household needs and no sharing of meals with them. The husband was defined as the head of household in the case of married couples. In all other cases, head of household was understood to be the member who was generally considered as such by the other members of the household (NSSG 1990). Those households with members having a full-time job in the police, in the diplomatic services, or among the forces were excluded from the sampling frame.

The FES provide a variety of information on household consumption expenditure, which is considered very important in analysing consumption patterns and investigating issues related to social as well as economic inequality and poverty in Greece. They also provide information on a number of demographic and socio-economic characteristics of the population. However, the use of FES has a number of drawbacks. One of the main disadvantages of FESs related with the way that denials, absences and unobtainable households were treated (with the exception of the 1957/58 survey). These households were replaced by other, usually neighbouring, ones. This violates the representativeness of the sample and produces systematic errors (biases) in the estimates (see Kish 1965). A second drawback is that the FESs conducted before 1974 did not provide information on the whole country. Therefore, no comparisons are feasible for the whole country across time. A third disadvantage - most commonly found in all similar surveys - is that people who live in atypical dwellings (i.e. gypsies, travellers, illegal foreign workers),

and in institutions (i.e. hospitals, prisons, camps) are not included in the sample. A fourth problem of the FES is that they do not provide sufficient information on the allocation of resources among the household members and on the intra-household transfers. Thus it is difficult to investigate issues related to intra-household inequality. Furthermore, the information collected on household income is considered unreliable (see Karageorgas 1973, 1977, Karageorgas et al 1990). More specifically, there is a systematic underestimation of household income, which appears significantly lower than consumption. Thus the NSSG, with the exception of 1957/58 FES data, have not published the results concerning income of any FES. The total household income of the 1974 FES represented only 71% of the relevant National Account figure.[4] The relevant agricultural income was only 52% (Kanellopoulos 1986).

2.3 Studies Based on FES

The first estimates on inequality in Greece, based on FES data, are found in a study carried out by Crockett (1967). This study used the published (group) data on income and consumption from the 1957/58, 1960-62 and, occasionally, from the 1962/63 FESs. As already mentioned, these FESs covered only the urban areas and were mainly designed for the construction of the consumer price index. The 1957/58 FES was based on a relatively large sample of 2,568 households, while the 1960-62 surveys were based on considerably smaller samples. In addition, the population from which the 1962/63 sample was selected was not the same, because it came only from the largest towns in

[4] In the British FES of 1976, the estimation of the total household income was 85.2% of the relevant National Account figure (Atkinson and Micklewright 1983, Borooah et al 1991).

Greece (those of 30,000 inhabitants and over). Therefore, their results are not strictly comparable. Crockett was aware of the drawbacks of the published data of the FESs, especially those concerning household income. Although questions on both consumption expenditure and household income were included in the FESs questionnaire, there was strong evidence that the response rate of questions on household income was higher among households with lower incomes (Tsakloglou 1988).[5] Thus taking into account that the household income was usually unreported, either because of "bad memory" or because people did not want to declare their real incomes (being afraid of tax authorities), Crockett avoided calculating summary measures of inequality and only presented some descriptive findings (Crockett 1967). According to these findings, one third of the population was found to live in the lower income brackets. In addition, she argued that inequality would have appeared higher if she had included data on rural areas, which she considered as poorer. Similarly, inequality in the distribution of household incomes appeared to be higher in the Greater Athens area than in other urban areas. Furthermore, she found that there is a strong relationship between the socio-professional status of the head of household and household income.

Ahluwalia (1974) and Jain (1975) have also used the 1957/8 FES's published data on household income. Although both used the same data sets, their findings vary significantly.[6] According to their estimates the relative income shares for the poorest 40%, middle 40% and richest 20% population were as follows:

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[5] Indeed, the group of households which responded to both clusters of questions, on income and expenditure, were found to have lower consumption and smaller houses. In those households also, a smaller proportion had a head who was in a high paid occupation (i.e. professional or administrative worker).

[6] Although both studies were based on household income published data of the 1957/58 FES, Jain's

	Ahluwalia (1974)	Jain (1975)
poorest 40%	21.0%	17.4%
middle 40%	29.5%	37.9%
richest 20%	49.5%	44.7%

Jain also drew a Lorenz curve and provided estimates of Gini and Kuznets indices for 1957/58, which were 0.381 and 0.2295 respectively. Jain was aware of the weaknesses of the data sets she used and as she pointed out, *"the data reported [...] are not in any sense presented as reliable or even best estimates"* (Jain 1975, p. xi). Ahluwalia in his cross-classification of countries by income level and equality, placed Greece among the group of countries with average (per capita) income and low inequality (Ahluwalia 1974, Table I.1).

Karageorgas (1973) calculated summary measures of inequality for the whole population using published data of the 1963/64 FES. This study was the first significant attempt to investigate the income distribution and the redistributive role of the tax system in Greece. As already mentioned, the 1963/64 FES covered only the semi-urban and rural areas. Furthermore, FESs failed to provide reliable data on household income.[7] Thus Karageorgas provided estimates on income distribution using a logarithmic consumption function deriving from National Accounts data. The estimate of the consumption function was based on time series of private consumption and disposable

reference was the International Labour Organisation (1967), while Ahluwalia's reference was Crockett's (1967) study.

[7] As mentioned before, the collected information on household income in FESs has been considered unreliable and thus NSSG has not published information on household income of any FES, with the exception of that of 1957/58

income from the National Accounts. He then estimated the family income corresponding to the consumption expenditure data from the 1963/64 FES. The relevant estimates of the Gini index for the distribution of family income provided by Karageorgas (1973) were:

Before taxes and transfer payments	:	0.5884
After taxes but before transfer payments:		0.6058
After taxes and transfer payments	:	0.5440

The most important finding of this study was that *"...the Greek tax structure as such accentuates the inequality in the distribution of income"* and *"...the transfer payment system has the result of reducing the degree of inequality of income distribution by redistributing income in favour of low income groups"* (Karageorgas 1973, p. 446). Income distribution in Greece, according to Karageorgas' estimates, appeared to be extremely unequal in comparison to other European countries where the Gini index did not exceed 0.45 during the same period.

Using the same methodology, Karageorgas (1977) utilised published data from the 1974 FES which covered, as mentioned above, both urban and rural areas in Greece. In this new survey Karageorgas did not calculate summary measures. Tsakloglou (1988), however, provides comparable estimates of Gini index which are:

Before taxes and transfer payments :	0.455
After taxes but before transfer payments:	0.457
After taxes and transfer payments :	0.435

According to these findings, income inequality in Greece declined during the period of 1964-74. It was still, however, much higher than in other (mainly European) countries.

Finally, the same methodology was used by Karageorgas and Pakos (1986, 1988) who utilised the data of the 1982 FES. Tsakloglou (1988) provided also a comparable estimate of Gini index (after taxes and transfer payments) which is 0.396, and noted a further decline in income inequality in Greece.

Pashardes (1980a) provided for the first time summary measures of inequality, based on 1974 FES consumption expenditure data, using equivalence scales (see also Pashardes 1980b). His main interest was to investigate the role of the income redistribution on the economic development process, through its impact on consumer expenditure. He, therefore, focused his research into the way that distributional policies can promote certain development goals. For the purpose of that study, he tried to adopt a more comprehensive definition of consumption expenditures, including not only purchases but also imputed rent of owner-occupied accommodation, consumption of own production and consumption of income in kind. Pashardes stressed the need to use equivalence factors in weighting different types of households with different needs and different consumption patterns for comparison purposes. Since there were no official Greek equivalence consumption scales available, and since he had no access to primary data of the 1974 FES, the equivalence scales he used were adopted from the British Supplementary Benefit Commission.[8] The calculated Gini index for the distribution of consumption expenditures per equivalent household was found to be 0.43 for the entire

[8] These scales use the consumption of one-couple-family as a basis. The single adult scale is 0.55, the under 5 years old children scale is 0.14 and the 5-13 years old children scale is 0.22.

population, 0.40 for the urban areas and 0.45 for the rural areas. Thus according to his findings, inequality appears higher in rural areas than in urban areas. Pashardes (1980a) pointed out that these findings were not in line with those of other developing countries, where inequality usually appears higher in urban areas (see Ahluwalia 1974).[9]

Carantinos (1981) provided estimates and summary measures of inequality in Greece using data from the 1974 FES, the Tax Returns of the period 1966-1976, as well as data from a sample survey he conducted for the Greater Athens area. Using no equivalence scales, the estimates he produced for the Gini coefficient for the distribution of per capita expenditure, which were based on published grouped data from the 1974 FES, were 0.3441 for the semi-rural and rural areas, 0.3215 for the urban areas and 0.3443 for the whole country. The Gini index for the distribution of household expenditure for the total country was found to be 0.3412. His estimates of Gini coefficient varied considerably compared to those of Pashardes (1980a). These differences could be partly attributed to the fact that Carantinos did not make use of equivalence scales. However, his estimates also showed that inequality in rural areas in Greece was higher than in urban areas.[10]

Athanassiou (1984) provided estimates and summary measures on the inequality in Greece using for the first time primary data (not published grouped data) from the 1974 FES. The main aim of his study was to investigate the extent and characteristics of inequality of income distribution in Greece. Furthermore, Athanassiou attempted to compare his findings with analogous findings from other developed countries. The

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[9] These findings will be also examined in more detail in Chapter 7.

[10] The findings of that study are also discussed in the following section, when the studies based on Tax Returns data are reviewed.

economic variable he initially used was the household consumption expenditure. Following Friedman (1957) and Ando and Modigliani's (1963) "life cycle" hypothesis of savings, he argued that consumption probably represents more accurately a person's well being, since savings regulate one's consumption so that consumption will correspond to income in the long run. Athanassiou (1984) provided the following estimates of Gini indices for the distribution of consumption expenditure per household. Using also equivalence scales, he additionally provided relative estimates on the distribution of consumption expenditure per equivalent adult:[11]

Gini index	By household	By equivalent adult
Entire population	0.361	0.301
Urban areas	0.341	0.270
Semi-urban areas	0.357	0.287
Rural areas	0.362	0.280
Greater Athens area	0.371	0.265

Thus according to his findings, inequality appears significantly lower when this equivalence scale is used. Inequality in the Greater Athens area was found to be the highest in the distribution by household and the lowest in the distribution by equivalent adult. According to the author, this can be partly explained by the high "inequality" in the size of households in this area (Athanassiou 1984, p. 77). Overall, inequality appeared higher in rural and semi-urban areas and lower in urban. In general, these results are in line with those of Pashardes (1980a) and Carantinos (1981), although their estimates on Gini index vary significantly and cannot be compared. Carantinos'

[11] The equivalence scale he used was based on the 1957/58 FES in which information on household income was also available. That scale was constructed by taking into account the differences in consumption according to household type within the same income brackets. Thus the scale adopted gives

estimates on Gini index are lower than Athanassiou's (1984), since Carantinos' calculations were based on grouped data. Therefore, inequality within income groups was not taken into account. Pashardes (1980a), on the other hand, used different equivalence scales. Furthermore, Pashardes' unit of analysis was the equivalent household instead of the equivalent adult used by Athanassiou. It has to be mentioned, that Athanassiou also estimated the Gini index for the distribution of consumption expenditure in certain population subgroups, defined by the occupational status of the head of household. The highest inequality was found among those households the heads of which were not working or were unemployed. The lowest inequality was found among those households the heads of which were labourers.

Athanassiou (1984) also provided estimates and calculated summary measures concerning the distribution of income. Three alternative methods were used to achieve an indirect estimate of personal income distribution. In the first method used, the calculation of income distribution was based on the distribution of consumption expenditure from the 1974 FES, and estimates of savings according to income brackets and source of income. Of course, the assumptions used for the allocation of total savings to population deciles could be criticised for being rather arbitrary. Using thus four hypothetical scenarios for the marginal propensity to save, Athanassiou estimated the value of Gini index for the distribution of income by household to be between 0.3745 and 0.3902, although he suggested that its real value must be between 0.3745 and 0.3789. In the second method used, the methodology was similar to that of Karageorgas (1973, 1977). Athanassiou (1984) estimated the distribution of household income using a linear as well as a logarithmic consumption function. The corresponding Gini indices

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to each adult a weight of 1.0 and to each child (0-15 years old) a weight of 0.4.

were found to be 0.356 and 0.364 for linear and logarithmic consumption function respectively. Finally, in the third method, Athanassiou attempted to construct an income distribution, based on information and estimates for the distribution, according to income source in different occupational groups. The Gini index for the distribution of pre-tax income by "person with income" (from various sources) was estimated between 0.372 and 0.379.

Like Athanassiou (1984), Kanellopoulos (1986) used primary data from the 1974 FES. In addition, Kanellopoulos used the unpublished income data which, as noted above, is generally considered unreliable since household income appears significantly lower than the relevant household consumption. The main objective of that study was the analysis of the determinant factors of income inequality and poverty in Greece. Using no equivalence scales, Kanellopoulos initially drew a Lorenz curve and provided estimates on Gini index for the distribution of household consumption expenditure, which was found to be 0.373. He then continued his analysis using the data on household income, although he was aware of its drawbacks. The concept of income used was the after tax, social security contribution and transfer payments household income. He mentioned that there is a significant underestimation of real household income, especially among those population groups the income of which derives from particular sources. Thus comparing with evidence from National Accounts, he found that the reported agricultural income represented only 52% of the relevant figure in National Accounts, while the total household income represented 71.0% of the relevant national figure. Kanellopoulos argued that this underestimation of household income did not vary significantly from that reported in similar surveys in other countries. Thus he drew a Lorenz curve for the

distribution of household income and he provided the following estimates on Gini index:

Entire population:	0.376
Urban areas:	0.326
Semi-urban areas:	0.342
Rural areas:	0.357

These results, even if they are not strictly comparable, are in line with those of Pashardes (1980a), Carantinos (1981) and Athanassiou (1984). Kanellopoulos (1986) also presented a number of distributions on household income by the type of household and by the personal characteristics of the population.[12] According to his findings, the use of household income instead of consumption expenditure shows no significant differences in inequality, when measured by the Gini index. This conclusion may be dangerously simplistic. The income data of FES is considered unreliable, not because it underestimates the total household income, but mainly because this underestimation varies greatly when different income sources and certain population subgroups are considered. If underestimation were the same for all households, irrespective of sources of income and characteristics of population, it could be easily adjusted without substantially affecting the analysis of inequality. The variety of underestimation rates of household income, concerning various sources of income and population subgroups, could significantly alter the real picture of income distribution. Therefore, even if the

[12] Kanellopoulos (1986) also provided estimates on poverty in Greece. The 50% of the average per capita income defined the poverty line adopted. He also used a simple equivalence scale, in which each additional member of the household is weighted with 0.7. According to his findings, 26.4% of the households were below the poverty line. He also estimated the rates of poverty for a variety of population subgroups, according to the type of household and the personal characteristics of the head of household.

summary measures of inequality remained unchanged, the rank of particular households or population subgroups in the distribution of income could be affected significantly, with substantial policy implications.

In his study of inequality and poverty in Greece, Tsakloglou (1988) used primary data from the 1974 and 1982 FESs. He conducted a systematic analysis of the measurement and the decomposition of inequality in Greece. He also constructed equivalence scales for the cost of children, based on empirical evidence.[13] Thus in his study, the distribution of consumption expenditure per equivalent adult is used as an approximation of the distribution of economic welfare. He provided the following estimates on a number of inequality indices for the distribution of the consumption expenditure per equivalent adult:

Year	Gini	Atkinson ($\varepsilon = 2$)	Theil T	Theil N	Variance of Logs
1974	0.342	0.323	0.200	0.196	0.387
1982	0.309	0.273	0.159	0.159	0.318

The above results are not strictly comparable with those of the previous studies mainly for the following reasons: First, he adopted a unique equivalence scale; second, he provided estimates on a number of inequality indices and summary measures which were ignored in other studies; and third, he used the micro data of the relevant FES surveys. There are also differences in the definition of consumption expenditure (since some items were excluded), the adjustments for inflation, the number of households included in the analysis and so on. Furthermore, his analysis was based on the equivalent

[13] The equivalence scale estimated and used by Tsakloglou weights with 1.00 each adult member of the household, with 0.40 each child aged 6-16 and with 0.40 and each child below the age of 6.

adult expenditure per individual, using a unique equivalence scale. Despite the fact that Tsakloglou based his analysis on the distribution of equivalent adult expenditure per individual, he also provided estimates on the above indices for the distributions of the total household expenditure by household, the per capita expenditure by household, the equivalent adult expenditure by household and the per capita expenditure by individual.

Tsakloglou's estimates showed that inequality was substantially reduced during the period 1974 to 1982 (see also Tsakloglou 1993). He also measured the decomposition of inequality by various socio-economic factors (see also Tsakloglou 1989). His findings showed that, in any population grouping, the between-group inequality accounts only for a very small part of the overall inequality. The within-group inequality is by far the most important contributor to the aggregate inequality.[14] Tsakloglou produced a number of papers in which he further examined his research questions and findings of the 1988 study (Tsakloglou 1989, 1990, 1993). Additionally, using mainly the FESs data, he has continued his research into a number of aspects related to inequality and poverty in Greece and investigated certain issues from a comparative perspective (see Tsakloglou 1996, Tsakloglou and Panopoulou 1998).

Finally, Karageorgas et al (1990) using data from FES (1961 to 1981/82) provided estimates on poverty and its by-product inequality in Greece. This study will be presented in more detail later in this chapter (see section 2.6).

[14] The findings of Tsakloglou's (1988, 1989, 1993) decomposition analysis will be discussed in more detail in Chapter 7.

2.4 Tax Returns - Statistics of Declared Income

Since 1960, the NSSG publishes the statistics on declared income. A number of studies on income distribution in Greece are based on Tax Returns (TR). In the case of Greece, TR are generally considered to be one of the most unreliable sources of information for investigating issues related to economic inequality. Despite these drawbacks, this data is the only available time-series information on income inequality on an annual basis since 1959. The information provided concerns the total income of the Income Unit by source.

One problem in using tax returns data derives from the definition of the unit of analysis. The concept of tax unit could vary significantly from that of household, family or individual. More specifically, it is quite possible to have more than one tax unit within the same household or family. This unit is mainly determined by the tax legislation, as well as by the individual's sincerity in declaring their real income, bearing in mind that they would prefer to minimise their tax payments. Furthermore, the concept of tax unit could also vary significantly between countries, as well as within the same country in different time periods. As pointed out by Borooah et al (1991) "*...a couple living with an 18 years old employed son, constitute a household but this household contains two tax units. If however the son was in full-time education [...] the persons concerned would constitute a single tax unit*" (p .12). Thus the use of tax unit as the unit of analysis causes a lot of restrictions in analysing issues related to income inequality, and difficulties in meeting the particular aims and the methodological needs of different studies.

A second problem is related to population coverage in TR. Until 1997, according to the Greek legislation it was not compulsory for all persons or households to fill in a tax

return. Thus tax units with an annual income below a certain minimum level were not obliged to fill-in a tax declaration form.[15] This minimum level was defined according to certain characteristics of the tax unit and increased from time to time. Therefore, a large part of the low income population was generally excluded from these statistics. Similarly, the majority of the agricultural households, the income of which comes from rural activities, had no obligation to declare their incomes. This legislation was introduced in the past, aiming mainly to encourage farmers to remain in their areas and continue their activities at a time when agricultural income was generally considered low. Although the economic position of agricultural households has changed rapidly during the last few decades, and their income is not considered as low as before, the legislation remained unchanged until recently, allowing these households to continue to benefit from being excluded from fill-in income tax return (Livada 1991). Thus as Lianos and Prodromidis (1974) pointed out "*...in 1961 and 1971, only 8.3 per cent and 20.7 per cent of the working population respectively, filled income tax returns*" (p. 22). Similarly, in 1960 only 13% of families filled income tax returns. This number was increased to 28% in 1970 and 52% in 1980 (Livada 1991).

A third problem, which significantly affects the reliability of TR data, is the phenomenon of high tax evasion in Greece, particularly among rich households (Karageorgas et al 1988, Athanassiou 1984, Tsakloglou 1988, Livada 1991). This high tax evasion is mainly observed in entrepreneurial and property incomes, which are significant income sources among high income groups (see also Chapters 6 and 7). Thus together with the phenomenon of low population coverage, tax evasion causes a

[15] Even according to recent regulations, fines are not imposed on those who fail to fill in a tax return, providing their annual income is below a certain minimum level.

significant underestimation of real personal income. As Lianos and Prodromidis (1974) showed, during the period 1950 to 1971 only 16.8% of the entire personal income appeared on tax declarations. Similarly, Athanassiou (1984) found that in 1975 the total declared income (to tax authorities) represented 29.9% of the income from National Accounts, while agricultural income represented only 0.2% of the relevant national figure.

Finally, a common problem in relevant data sets is related to the definition of income used by tax authorities in TR. In this definition, income in kind, consumption of own production, capital gains and so on, are generally excluded. As Tsakloglou (1988), among others, has argued, this definition "*...does not seem to be appropriate for welfare comparisons across households*" (p. 14).

2.5 Studies Based on Tax Return Data

The first significant study of income distribution in Greece, based on data from TR returns, was that of Lianos and Prodromidis (1974). In this study, the authors provided estimates of the Gini index for the pre-tax income for the period 1959-1971. According to their findings, inequality appeared to be increased during that period. The estimated values of the Gini index for 1959 and 1971 were 0.4204 and 0.4492 respectively. The highest inequality was observed in 1967 (Gini = 0.4626) and the lowest in 1960 (Gini = 0.4108). The authors were aware of problems related to the reliability of TR data. As they pointed out "*...the family income reported on the individuals' tax returns is a very small fraction of personal income in Greece. In fact, it averaged a mere 16.8 per cent of*

personal income during the sample period 1950-1971" (Lianos and Prodromidis 1974, p. 22). This was also the reason why Sawyer (1976) argued that the results of this survey were not reliable.

Using the same data sets as Lianos and Prodromidis (1974), Tsoris (1975) estimated the Theil index for the above period. According to his findings, the Theil index varied between 0.379 and 0.278 during the period 1957 to 1970. His findings were antithetical to those of Lianos and Prodromidis (1974), because they indicated a decline in income inequality during the same period.

Germidis and Negreponti-Delivanis (1975) also used data from TR, as well as the National Accounts, in order to investigate the trends in income distribution in Greece. They provided estimates of the Gini index for the distribution of total household income: i) before direct and indirect tax, ii) after direct, but before indirect tax and, iii) after direct and indirect tax. According to their findings that were based on TR data, the Gini indices for 1961, 1966 and 1971 were:

GINI	1961	1966	1971
Before direct and indirect tax:	0.378	0.371	0.363
After direct/ before indirect tax:	0.343	0.343	0.340
After direct and indirect tax:	0.413	0.398	0.393

These estimates suggest a decline in inequality in Greece during the above period. Their findings are in line with Karageorgas (1973, 1977) and Karageorgas and Pakos (1988). Direct taxation appeared progressive and thus it reduced the overall inequality. By

contrast, indirect taxation appeared quite regressive. It seems that the tax system in Greece increases the overall inequality of income.

Mourgos (1980) investigated the economic development and the distributional trends in post war Greece. The main source of data in his analysis of distribution trends during the period 1955-1977 was the nominal income declared by taxpayers. Mourgos was aware that only a small fraction of the families and of the total personal income was represented in TR. In order to estimate the distribution of income for the total population in Greece, he estimated - under certain assumptions - the income for those families who did not declare their income to tax authorities. In particular, agricultural family income was estimated using data from National Accounts, as well as evidence from other countries. He, therefore, generated 10 different data sets, each of which corresponded to different assumptions on the value of log-variance for rural or rural plus semi-rural incomes. He calculated a number of inequality indices (Gini, Kuznets, Maximum Equalisation Percentage and Income Shares) for each of the data sets that he had generated.[16] According to his findings, during the period between 1955 and 1976, the income share of the 20% of the richest population (for each data set) fluctuated around a central value without showing any clear trend. The income share of the 5% and 10% of the richest population showed a decline after 1970. Similarly, the overall clear trend of the income share of the poorest 10% of the population - though it fluctuated during this period - was to decline over time. The estimates of the Gini coefficient showed a clear pattern for eight of the data sets. The value of the coefficient increased during the first third of the period, remained rather stable during the second third, and then declined

[16] Estimates of these indices for each year of the period between 1955 and 1976 were provided for the nine data sets.

substantially during the third period. By contrast, the data set deriving directly from TR did not show the same trend. The value of the Gini coefficient declined considerably the first five years, and then it fluctuated without showing any clear trend.

As mentioned above, Carantinos (1981) also provided estimates for the Gini, Kuznets, and Theil indices using TR data, along side with FES data, for the period 1966-1976. None of the used indices showed any systematic trend in inequality of pre-tax income among the taxpayers during the above period. The only considerable change of the Gini index was observed between 1969 and 1970. Carantinos (1981) also noticed that the substantial increase in the number of people that filled in tax returns, which took place during that period, had actually no effect on the way that income was distributed among tax payers. The analysis of the income shares by population deciles for the period 1967 to 1976 showed that there was a small decline in the shares of the 10% of the poorest and 10% of the richest population in favour of those in middle income groups.

Livada (1988) based her analysis of income inequalities in Greece on tax-returns data for the period 1959 - 1986.[17] Although she was aware of the limitations set by the weaknesses of the time series statistics used, she attempted to calculate summary measures for the above period. The aggregate measures she estimated were the Gini index, the Logarithmic Variance, the Relative Mean Deviation, the Mean Logarithmic Deviation, the Theil index, and the Monotonic Transformation of the Coefficient of Variation. She also drew the corresponding Lorenz curves for the above years. Livada's estimates were based on grouped data of family incomes before taxation. In addition, no use of equivalence scales was made. According to her findings, the different indices

[17] See also Livada (1991).

used indicated different trends in inequality for that period. More specifically, the Logarithmic Variance and the Mean Logarithmic Deviation showed a significant increase in inequality, while the Theil indices and the Monotonic Transformation of the Coefficient of Variation indicated the opposite. The Gini indices and the Relative Mean Deviation remained rather stable during this period.

A number of studies have also investigated the influence of tax policies on the distribution of income using mainly the TR data (Bakarezos 1984, Patiniotis 1983, Loizides 1986, 1988, Papapanagos 1994). Some of the findings of these studies will be reviewed in Chapter 6.[18]

2.6 Surveys and Studies Conducted by the National Centre for Social Research.

In the early 1980s, following a suggestion put forward by Karageorgas, a research team was formed at the National Centre for Social Research (acronym in Greek: EKKE) in order to undertake a systematic study of economic and social inequalities in Greece. A variety of publications on these issues have been produced since then. Additionally, two sample surveys, specially designed to analyse the social and economic inequality in Greece, were also conducted. Unfortunately, for reasons that are explained below and in Chapter 4, only limited utilisation of the information provided by these two sample surveys has been made so far by researchers.

[18] See also footnote 29 in this chapter.

Of those studies produced in EKKE which did not use information from these two sample surveys, Karageorgas et al's (1990) was the most significant. That study was, as already mentioned in Section 2.3, a systematic analysis of poverty in Greece using data from various sources such as the 1957/58, 1963/64, 1974 and 1981/82 FESs, the 1961, 1971 and 1981 Population Census, the National Accounts and so on. The particular part of their work related to inequality could, therefore, be seen as a by-product of that study. The estimated values of Gini index for the urban, as well as semi-urban and rural areas, were:

Gini	1974	1981
Total country	0.3074	0.2476
Urban areas	0.2919	0.2409
Semi-urban and rural areas:	0.2921	0.2307

Thus according to their findings there was a decline in inequality during the period 1974 to 1981. In addition, these estimates showed that, although in 1974 inequality in urban as well as in semi-urban and rural areas was almost identical, in 1981 inequality in urban areas appeared higher. The findings of that study also suggested that inequality in rural and semi-rural areas declined between 1963/64 and 1981/82. By contrast, inequality in urban areas increased during the period 1957/58 to 1974 and then declined during the period 1974 to 1981/82. Despite the decline that took place during this second period, the overall inequality in urban areas in 1981/82 was higher than in 1957/58.

The first sample survey specially designed to analyse income inequality in Greece was undertaken by EKKE in 1985. It was also the first systematic attempt to provide reliable income distribution statistics in Greece. The unit of analysis was considered to be the

household, which was defined in a similar way with the FESs and United Nations (1977) guidelines. The sample fraction was considerably high (1/275) while the total sample was 11.500 households. The method used to collect information was structured interviews. The main target of this study was the collection of data on gross (pre-tax) and disposable (after tax) income, as well as on a variety of social and demographic characteristics of the household. The following income concepts were used:

- Gross household income by various sources. This includes the total money income before taxes and other social security contributions of all household members. Income in kind or auto-consumption are generally excluded (Karantinos 1990, Karageorgas et al 1988). The gross income was divided into:
  - salaries and wages
  - earnings from liberal professions (entrepreneurial income)
  - earnings from interests, rents (property income)
  - other transfers (which include pensions, social security benefits etc).
- Net household income, which is the disposable household income after the taxes and other social security contributions.

One of the disadvantages of this survey - common to similar surveys - has to do with the definition of income used. This definition is considered rather narrow, since elements such as income in kind, imputed rent, as well as production for own consumption are not generally included. These income elements may have a significant impact on total household consumption, especially in agricultural households. According to estimates based on FES, the auto-consumption in agricultural households appeared to represent more than 10% of the total household consumption (Karantinos 1990). Similarly, capital gains are quite difficult to estimate.

Another problem - also common to similar surveys - is that certain population groups are excluded from the sample (people who live in atypical dwellings, institutions etc). This part of the population usually belongs to the lower income groups. Similarly, the information provided in these surveys for analysing the intra-household inequality is considered rather insufficient.

Despite these drawbacks, the 1985 survey is considered one of the most reliable sources of information for analysing income distribution in Greece. The information provided allows the investigation of a number of issues related to economic and social inequality in Greece, which is difficult to achieve when using other available data sources. Unfortunately, the available information from this survey concerns so far only the Greater Athens area (Karageorgas et al 1988). Information and statistics for the total country are not available, since the necessary data cleaning and organising of the original raw data has not yet been undertaken.

As already noted, the study by Karageorgas et al (1988) presents results on inequality in the Greater Athens area based on the 1985 survey. Making no use of any equivalence scale, they found that the corresponding Gini index to the distribution of household income before and after income tax and social security contributions were 0.355 and 0.332 respectively. This evidence suggested that, despite the progressiveness of income tax imposed by the Greek legislation, direct taxation only marginally reduces inequality of household income. The authors of the study also provided estimates on the distribution of personal income by income brackets and by population subgroups

according to the type of household and the personal characteristics of the head of household.

Ketsetzopoulou (1990) investigated the economic inequality in the Greater Athens area using also information from the 1985 sample survey. She made use of an equivalence scale, which weights the first member of the household with 1 and each additional member with 0.5. She provided estimates of the Gini and Theil indices for the distribution of gross equivalent household income, as well as for the income from various sources. Additionally, she provided estimates based on the per-capita household income, as well as the income per (individual) income recipient. Ketsetzopoulou estimated the following values of Gini and Theil indices for the distribution of income in the Greater Athens area:

	Gini	Theil
Total household income	0.345	0.221
Per capita household income	0.352	0.231
Income per income recipient	0.368	0.259

According to her findings, inequality appears higher when the demographic variable is the income recipient (individual), and lower when it is the household. Additionally, inequality among households is slightly lower when the economic variable used is the total rather than the per capita household income. Similarly, Ketsetzopoulou showed that inequality varies greatly among the different income sources. In general, income from self-employment and entrepreneurial activities is the most unequally distributed

one among households, followed by rents. By contrast, pensions appear to be the most equally distributed income source.[19]

Using the same data, Fetsi (1990) investigated the distributional impact of the public sector through direct taxation, social security contribution and transfer payments. She presented the following estimates of the Gini and Theil indices, concerning the distribution of income in the Greater Athens area (Fetsi 1990):

	Total income	Disposable Income
Gini	0.344	0.324
Theil	0.210	0.186

According to her estimates, income tax and social security contributions have a rather weak impact on reducing the overall inequality.[20] In particular, she found that direct taxation was only slightly reducing total inequality. This was despite the fact that the Greek legislation imposed progressive income taxation. By contrast, the social security contributions had a negative effect on reducing inequality. Only the transfer payment appeared to have a positive impact on reducing the overall inequality.

The second sample survey was conducted by EKKE in 1988/89 (Yfantopoulos et al 1989, Deleeck et al 1991). This survey was conducted within the framework of the

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[19] In the distribution of income by individual income recipients, rents were the source that appeared more equally distributed.

[20] It has to be noted that Fetsi's (1990) estimates on the Gini and Theil indices vary from those of Karageorgas et al (1988) and Ketsetzopoulou (1990). The differences in estimates between Karageorgas et al (1988) and Ketsetzopoulou (1990) may well be attributed to the equivalence scale used by the latter. It is not clear if Fetsi (1990) made use of an equivalence scale or not. Additionally, in both the papers of Ketsetzopoulou (1990) and Fetsi (1990) it is not explained clearly whether their estimates are based on micro-data or group data. They also did not provide any details on the procedures followed in estimating these inequality indices.

Second European Anti-Poverty Programme. The main aim of this project, titled "Poverty Indicators: Social Indicators of Social Security", was to pursue a comparative study on the extent and social distribution of poverty and on the adequacy of social security. The study was based on surveys of representative samples of households in seven countries/regions in the EC (Deleeck et al 1991).

The concept of income used in this project was the net monetary total household income and the net monetary equivalent household income. However, in the Greek questionnaire there were also questions concerning the gross household income and, therefore, relevant information was collected aiming to allow further investigation of the economic inequalities in Greece. For the selection of the sample a two-way stratified selection technique was adopted. The general sample fraction was 1/1000 based on the 1981 Population Census. The total sample comprised 3,112 households. In 2,980 households interviews were successfully conducted giving a response rate of 95.8%, which is considered particularly high compared to similar surveys conducted in other countries (Atkinson and Mickleright 1983). Trained interviewers were responsible for collecting information from structured interviews.[21]

The main drawbacks of the 1985 survey were also present in the 1988 survey. These were mainly related to the narrow definition of household income, as well as to the fact that people living in atypical dwellings and institutions were not included in the sample. To this date, the published results on income distribution for the whole country are rather limited. (Yfantopoulos et al 1989, Deleeck et al 1991, Papatheodorou 1992, 1997, 1998a, 1998b, Balourdos 1997).

[21] The 1988 sample survey will be reviewed in more detail in Chapter 4.

In Yfantopoulos et al (1989) and Deleeck et al (1991), only a limited number of tables and summary statistics on the distribution of disposable total and equivalent household income for the whole country were presented. The main aim of these studies was to provide a comparative set of social indicators on poverty and social security for seven EU counties and regions (see also Deleeck and Van den Bosch 1992).[22] Therefore, the statistics and summary measures provided for the distribution of income were most likely a by-product of their analysis. Additionally, a concept of income was adopted (disposable household income) that was considered more appropriate for constructing the poverty indicators, in line with the needs of the project. The estimated Gini and Theil coefficients for the distribution of total disposable household income were 0.409 and 0.335 respectively.[23] Overall, it was found that inequality in Greece was the highest among the European countries and regions that participated in this project.[24]

In Balourdos et al (1990), four members of EKKE's research team who had conducted the 1988 survey investigated inequality in the Greater Athens area. In this study we presented some descriptive statistics and summary measures on the distribution of disposable, as well as on the gross household income. Making no use of equivalence scales, the estimated Gini index for total gross and disposable household income was 0.3368 and 0.3285 respectively. According to our findings, the income taxes and social security contributions only slightly reduced the observed inequalities in the distribution

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[22] Deleeck et al (1991) used the results for Greece reported by Yfantopoulos et al (1989).

[23] The estimates presented in these indices were based on the total and not on the equivalent household income.

[24] The countries and regions that participated in this project were Belgium, The Netherlands, Luxembourg, Ireland, Lorraine, Catalonian, and Greece.

of household income in Athens. These results are similar to those of Karageorgas et al (1988) and Fetsi (1990).

For the first time in 1992 detailed statistics and summary measures on the distribution of gross, as well as on disposable income for the whole country, based on the information provided by the 1988 survey, were presented by Papatheodorou (1992). I estimated the household income before taxes and social security contributions (total and by source) using the raw data of the 1988 survey. Being aware of certain drawbacks and methodological problems in the calculation of the variable of disposable household income by Yfantopoulos et al (1989) and consequently by Deleeck et al (1991), I re-estimated this variable in a different way using the original raw data of the 1988 survey. Due to the re-estimation and to the further data cleaning that I conducted, my estimates on a number of variables and, in particular, on disposable income vary from those of Yfantopoulos et al (1989) and Deleeck et al (1991). The estimates provided in Papatheodorou (1992) concern the distribution of total gross household income by various sources, as well as the disposable income and the taxes and social security contributions, according to income deciles and certain population subgroups. Despite the fact that in the analysis by population subgroup I made no use of equivalence scales, in the analysis by deciles I also presented estimates on the per-capita and equivalent household income.[25] The following estimates on the Gini and Theil indices were found:

	Total income		Per capita income		Equivalent income	
	Gross	Disposable	Gross	Disposable	Gross	Disposable
Gini	0.38984	0.38063	0.38668	0.38558	0.37360	0.36395
Theil	0.25254	0.24240	0.25132	0.24211	0.23300	0.22329

[25] The equivalence scale used was the one recommended by OECD and adopted in a number of EU studies. This scale weights the first adult with 1 and then each additional adult with 0.7 and each additional child with 0.5.

According to Papatheodorou (1992) and the findings presented, there was no substantial distributional impact of income taxes and social security contributions. These results for the whole country were in line with those found in the studies that investigated the distribution of income in the Greater Athens area (Karageorgas et al 1988, Fetsi 1990, Balourdos et al 1990). I also found that wages and salaries were by far the most significant source of household income, while the most unequally distributed were the entrepreneurial and property incomes.

Balourdos (1997) has also presented statistics and summary measures on the distribution of income and poverty in Greece that were based on the 1988 sample survey.[26] A substantial part of his work was based on tables and estimates that were already produced and presented in Yfantopoulos et al (1989), Deleeck et al (1991) and Papatheodorou (1992). In his analysis he also made use of the income and population variables created by Yfantopoulos et al (1989) and Papatheodorou (1992). The results and statistics presented by Balourdos must be treated with caution as they might mislead the reader. He was probably unaware of the differences in variable definitions and methodology followed in creating certain income variables by Yfantopoulos et al (1989) and Papatheodorou (1992) based on the 1988 survey. Therefore, in his study he presented estimates and summary statistics that seem to be conflicting (although they refer to the same variables).[27] Additionally, he provided at least three different estimates

[26] This study is based on his PhD thesis.

[27] It is indicative that the estimates Balourdos (1997) presented in Tables 25 (page 176) and 31 (page 192), although both concern the distribution of total disposable household income by deciles, they vary considerably between them. The estimates he presented vary greatly not only in average total values (of disposable household income), but also in the average values found in each decile, as well as in the contribution of each individual source to total household income (see also Table 32 of his study). It is obvious that the former two tables present the distribution of two different variables. There is no

of Gini index for the distribution of disposable household income that vary substantially between them.[28] No explanation for these significant differences is provided by the author, and no information is given on the methodology adopted for calculating these inequality indices.

2.7 Conclusions

The above brief account showed that Greece, one of the poorest countries in the EU, has also a poor reputation as far as research into social and economic inequality is concerned. Although there has been an increase in research activity in this area, especially since the mid 1980s, most of the studies have failed to offer a clear picture of the inequality in Greece, while often the estimates presented are unsuitable for comparative purposes or even inaccurate. A number of the studies reviewed did not have the investigation of inequality as their main objective. The relevant estimates and summary measures on inequality presented were therefore a by-product of their analysis. It is clear that only a few studies attempted a systematic analysis on issues related to social and economic inequality in Greece. Despite the significant efforts of a number of researchers, the lack of reliable statistical data and information have set serious limitations to the investigation and in-depth analysis of particular aspects of inequality.

A number of studies have been based on Tax Return data, which is considered rather

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explanation provided for these substantial differences in the estimates for the distribution of the same variable given by Balourdos (1997).

[28] Thus in page 112 of his study (Balourdos 1997) the Gini index for the distribution of net disposable income is estimated 0.451, in page 169 the same index for the same variable is found to be 0.38, while in page 198 he used the value 0.409 (the latter was the estimate provided by Deleeck et al 1991).

problematic for analysing particular aspects of social and economic inequality in Greece. High tax evasion - especially among the rich households - and the particularly low proportion of population that declare their income (to tax authorities), are among the reasons why the use of TR is generally considered insufficient and unreliable for capturing the real dimension of income inequality in Greece. Often the estimates and summary measures (of the same indices for the same years), presented by the studies based on TR, differ substantially between them. Additionally, these studies also fail to reach consensus on the observed fluctuations of inequality in the course of time or to show a general clear trend. Furthermore, it is difficult to argue whether the observed fluctuations of inequality in the course of time are caused by actual changes in the distribution of income or by changes in the population coverage in TR statistics (the proportion of the population that declare their income to tax authorities). Mourgos (1980) attempted to estimate the distribution of income for the whole population, including also the part of the population which did not declare their income. He showed that assessment of the trend of inequality varies significantly when based on estimates for the distribution of income for the whole population compared to when based on data deriving directly from TR. One of the findings of studies based on TR was that direct taxation reduces the observed inequality in the distribution of income, though not significantly (Germidis and Negreponti-Delivanis 1975).[29] Of course, this is a tautology, since these studies were based on declared household income. Therefore, their findings reflect the progressiveness that the tax system should have according to the Greek legislation and not the real effect of income tax on the actual distribution of household income.

[29] Using also TR data, Loizides (1988) and Papapanagos (1994) reached similar conclusions concerning the distributional impact of direct taxation on overall inequality. By contrast, Patinitotis

Family Expenditure Surveys (FESs) have been proved to be a more significant source of information for investigating issues related to the economic inequality and poverty in Greece. Therefore, they have been the most frequently used data source for studies in the field since the 1980s. Although the information they provide on household income is not reliable, FESs are an important source of data on household consumption expenditure, as well as on a number of other social characteristics of the population. FESs are not conducted frequently, whereas information for the whole country can be found only after 1974. In general, the studies based on FES presented more reliable estimates and summary measures concerning economic inequality in Greece than those based on TR data. Despite this fact, the aspects of inequality that were investigated in these studies were also restricted by the limitations of the information provided by FESs. Additionally, the estimates provided are often not comparable between studies and not suitable for comparative purposes, since each study followed a different methodology and different data and variable definitions in investigating certain issues. One of the common findings is that, in general, inequality appears higher in rural and semi-rural areas and lower in urban areas (Pashardes 1980a, Carantinos 1981, Athanassiou 1984, Kanelopoulos 1986). Moreover, the evidence suggests that from the early 1960s to the mid 1980s income inequality declined (Karageorgas 1973,1977, Karageorgas and Pakos 1988, Tsakloglou 1988).

Finally, it seems that only limited use has been made of the data provided by the two important sample surveys that were conducted by EKKE. These surveys were specially designed to collect detailed information on a variety of issues on economic

(1983), Bakarezos (1984) and Vartholomeos (1984) argue that, in general, the tax system in Greece

and social inequality. Furthermore, due to lack of necessary funds, bureaucratic reasons, and the fact that the necessary data organisation and cleaning has not taken place, the full data sets of these surveys are not presently available.

The review of the studies above has shown the scarcity of systematic analysis in this area. It has also signified the need for accurate and comparable estimates on issues related to income inequality in Greece, using more comprehensive and appropriate data sources than the ones used by relevant studies in the past. From a policy perspective, detailed and accurate information is vital for defining the population needs and identifying priorities for interventions. The utilisation of the information provided by the EKKE's surveys is, therefore, of great importance and would contribute significantly to this purpose. This would also allow an in-depth analysis of a number of aspects and issues related to social and economic inequality that were never or were only partially investigated in the past. Among these aspects, one could recognise the role of the family background in intergenerational transmission of inequality, the decomposition of inequality by income source and by certain population subgroups, and the distributional impact that government policies have on the actual distribution of household income -mainly through taxes and social security contributions. This is an area that this study aims at contributing.

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increases inequality as far as the distribution of income is concerned.

CHAPTER THREE

THEORETICAL AND CONCEPTUAL ISSUES IN ANALYSING AND MEASURING INEQUALITY

"The question we must keep in mind is equality or inequality in what sort of thing? For this is a problem, and one to which we need political philosophy"
Aristotle "Politics"

3.1 Introduction

In this chapter we will try to clarify some of the theoretical and methodological issues which one encounters when analysing and measuring economic inequality. Although there is no intention for an in-depth review of the above issues, which is a large task in itself, it is rather unavoidable not to discuss some of them, relating directly to this study. These issues are associated with the initial question of "inequality of what" which any inequality exercise needs to answer.

In section 3.2 some theoretical issues in analysing and measuring economic inequality are discussed. These have mainly to do with the meaning of inequality. More precisely, the question driving this section is whether we could have a value free

concept of economic inequality. Of course, there is no attempt to review the controversies between the different principles and to analyse the basic axioms on which certain theories are based. The main purpose is to show the dual nature of the concept of inequality as descriptive and prescriptive, which affects any measurement. The intention is also to show that the chosen "focal variable" in any inequality exercise is not neutral because it is affected by a specific theoretical framework - even if that framework is not clearly declared - and by the tasks of any particular study. This determines the research questions and the methodology followed and, therefore, puts limits and restrictions on analysing economic inequality.

Section 3.3 discusses certain conceptual and methodological problems in analysing economic inequality. These problems have mainly to do with the concept of "focal variable" subject to the restrictions imposed by statistical limitations. The availability of statistics relating to income inequality in Greece has already been discussed in detail in Chapter 2. At this stage the following questions arise: How can a more comprehensive index of economic status be created? Which unit of analysis should be used? How could units with different size and structure be compared? What time period reference should be used?

Overall, the analysis in this chapter will help convey the narrowness and the limitations of the concepts adopted and the methodology followed in the empirical investigation, for capturing certain aspects of inequality. Additionally, it will provide the necessary framework for clarifying the objectives and for understanding the development of the methodology adopted in this study as described in the following

chapters. Finally, a number of aspects that were investigated, and hypotheses that were tested in this study emerge directly from this discussion.

3.2. Theoretical Issues

The initial question in any inequality exercise is "inequality of what". Although "inequality" is often used in describing economic states, its meaning is not self-explanatory. Let us consider three persons Anne, Bill, and Chris and let us examine a number of statements, summarising some of what ordinary people usually say concerning their economic status:

- *Chris has a higher income than Bill.*
- *Bill has more property than Chris.*
- *Anne earns the same salary as Chris.*
- *Bill is better off than Chris because his income comes from the property he inherited, while Chris has to work really hard to make a living.*
- *Chris is better off than Anne because he lives on his own, while Anne has a big family and she is the only income provider.*

Of course, these are only few of the possible observations people could make about their economic status. In the above inequality exercise we should consider the following: i) Economic inequality – and, consequently, any of its measurements - has a relevant meaning; the economic status of one person (or group of persons) can only be defined in comparison with the economic status of another person. ii) Any of the

above comparisons is based on different criteria (or on different personal attributes) and, consequently, on different definitions of economic inequality. iii) Each of the above definitions seems to satisfy different purposes and meet different needs for comparison. It has to be noted that the different definitions are not free from value judgement about preferences, choices, needs and so on.

The relative meaning of inequality implies "a departure from some idea of equality" (Cowell 1995). Thus the question "equality of what" is the one that determines the criteria for assessing inequality (Sen 1992). According to Cowell (1995), *"...the term equality evidently has compelling social overtones as a standard which is presumably feasible for the society to attain"* (p. 1). The meaning of "equality" is, therefore, a central issue in any theory of social arrangement. Different schools of thought have different approaches to the meaning of equality – inequality, which appears to be the central social exercise where equality is the objective (Sen 1992).

Different value judgements lead to quite different views about equality – inequality, and this could be used as the classificatory basis for different theories of social arrangements (Sen 1992, Atkinson 1983).[1] Sen (1992) also argues that *"...it is difficult to see how an ethical theory can have general social plausibility without extending equal consideration to all in some level"* (p. 3-4).

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[1] These diverse views are also reflected in the different ways that the notion of welfare has been interpreted and defined by various schools of thought. George and Page (1995a) noted that *"essentially [...] the notion of welfare reflects the well-being of individuals. [...] Defined in broad terms, the notion of welfare inevitably involves issues of distributional justice"* (p. 1-2). Furthermore, as George and Wilding (1994) argued, *"...ideological debates* [on the notion of welfare] *have placed a part in shaping both the growth and nature of welfare state"* (p. 14). A comprehensive discussion on the different views and ideologies on welfare is provided by George and Page (1995b), George and Wilding (1994). See also, Barry (1990), Gouph (1979) and George and Wilding (1976).

Sen (1992) claims that the question of "equality of what" reflects human diversity.[2] Human beings differ from each other in a number of characteristics and attributes (sex, age, education, income, wealth etc). As a result, different theories are based on particular personal attributes in order to achieve comparison between persons. In other words, any theory uses its own "focal variable" for the judgement and measurement of inequality. It is obvious that the result of any comparison depends on the chosen "focal variable", while often the definition of equality - based on a particular "focal variable" - may violate the basic egalitarian principles of other theories. As Sen (1992) wrote, *"... a libertarian demanding equal rights over a class of entitlement cannot, consistently with that, also insist on equality of incomes. Or, a utilitarian demanding equal weight on every unit of utility cannot, consistently with that, also require equality of freedoms and rights..."* (p. x).

Thus in an empirical investigation things could appear more equal using one variable and more unequal using another. Osberg (1991) argued that it is essential to distinguish between economic inequity and economic inequality. That is, to make a distinction between actual differences among the population (inequality) which are value free, and potential or unjustifiable differences (inequity) in which value - ethical judgements are involved.[3] Thus if by economic inequality we mean broad differences of well-being between people, then in our analysis ethical judgements about choices, needs, fair or unfair allocation of resources, just or unjust distribution of outcomes and so on are involved. In contrast, if we mean differences among people in their

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[2] See also Sen (1982, 1987a,b).

[3] Osberg (1991), of course, agrees that the motive for studying economic inequality always stems from a concern for some notion of inequity.

command over economic resources - the most commonly used definition in relevant studies – this, then, is apparently a value free concept.

How accurate is the above distinction? Can we have value free concepts of economic inequality? Inequality cannot be seen as a pure descriptive and, consequently, value free concept of actual differences between persons, because it refers to the normative notion of equity, which is based on value judgement (Tinbergen 1978, Sen 1978). Similarly, it is difficult to consider inequality as a pure prescriptive concept because *"...it also has descriptive meaning from which the concept cannot be easily divorced"* (Sen 1978, p.81).

Since 1950, economic analysis has focused on efficiency as a value free concept (Thurow 1975). While equity is the demanding "ends" of the central social exercise - as determined by different schools of thought - which involves value judgement, efficiency is the "means" to these "ends". Thus given the ends, efficiency appears universally desirable and, consequently, value free. As Thurow (1975) argues, means and ends are scrambled. *"Even if this common perception of efficiency as value free was correct, which is not, it would still be impossible to avoid the concept of equity in an analysis of the mechanism of income distribution [...] Often our value judgements attach more importance to the means by which incomes are distributed (fascism, communism, capitalism, welfarism) than to ultimate distribution of prizes. The means are in fact ends in themselves"* (p. 21).

The above distinction between ends (e.g. equity) and means (e.g. efficiency which may be served by some degree of inequality) is partly reflected in the proposed

measures of inequality. These can be classified in two main categories: objective and normative (Sen 1997a). As pointed out by Sen (1997a), this division could be expressed respectively as *"seeing more or less inequality..."* and *"valuing it more or less in ethical terms..."* (p. 2). In the first case, we are interested in the distribution of some particular attribute (e.g. income, wealth, earnings) using certain statistical measures. In case of normative measures, ethical judgements about the personal and social welfare are involved. This means that, in measuring inequality, assumptions about the influence of a number of variables on personal welfare, as well as assumptions about the influence of inequality differences among persons (or other units) on social welfare are used. Thus inequality indices such as the Range, the Relative Mean Deviation, the Variance, the Coefficient of Variation and the Gini are generally considered positive measures, since they neither explicitly refer to nor are they based on a concept of social welfare.[4] Some of these indices were directly borrowed from statistics and some were derived from certain diagrams (Lorenz curve, Pen's Parade) that were used for charting inequality (Cowell 1995). By contrast, indices such as those proposed by Dalton and Atkinson are considered as normative measures, since they are directly based on a notion of social welfare and, therefore, introduce social judgements explicitly (Dalton 1920, Atkinson 1970, 1983, Sen 1997a, Cowell 1995, Lambert 1993).

In the former example, the observation that *"Chris has a higher income than Bill"* could be considered as representing an objective notion of inequality. In the

[4] Although these indices do not explicitly refer to a concept of social welfare, this does not mean that they do not implicitly introduce certain value judgements in measuring inequality and in comparing different distributions. Each of these indices weights transfers differently at different points of the income scale in a distribution, and thus each implies a certain welfare function (Atkinson 1983, Jenkins 1991a, Lambert 1993, Cowell 1995).

observation *"Bill is better off than Chris because his income comes from the property he inherited, while Chris has to work really hard to make a living"* value judgements about personal welfare (and thus about social welfare when we refer to larger groups) are introduced, and this comparison represents a normative concept of inequality. How important is this division in analysing and measuring inequality? Can we draw a line between objective and normative features of inequality measures? The answer could be similar to that concerning the distinction between equality and equity and relates to the nature of the concept of inequality. Although these approaches seem to be crucial in analysing inequality, in practice there are no sharp differences. There is always an objective notion of inequality; *"Chris has a higher income than Bill"*. At the same time, we cannot avoid value-ethical judgements when we compare different states and try to explain these differences; *"Chris is therefore better off than Bill"* or *"Bill is better off than Chris because..."* (depending on whether additional information is introduced or whether the comparison is based on certain social judgements).[5] Thus even when an objective criterion - e.g. income and/or wealth - is used as a classificatory variable, this criterion could represent at the same time and under certain assumptions the adopted meaning of inequality, which is normative. Similarly, even by adopting a certain "objective" inequality measure in comparing income distributions, social judgements representing a normative concept of the inequality are introduced, even though these judgements are not always clearly declared. Often, of course, in the empirical investigation the focus on one particular aspect/variable and/or index in measuring inequality could reflect the aims and targets of a certain study under certain restrictions imposed by the statistical limitations, and

[5] Even the statement *"Chris has a higher income than Bill"*, that seems to be based on an objective criterion and notion of inequality, it also introduces a value judgement on personal welfare comparing the two persons and, therefore, represents a notion of inequality which is normative.

not necessarily a coherent concept of inequality. As Sen (1997a) wrote, *"even if we take inequality as an objective notion, our interest in its measurement must relate to our normative concern with it, and in judging the relative merits of different objective measures of inequality, it would indeed be relevant to introduce normative considerations. At the same time, even if we take a normative view of the measures of income inequality, this is not necessarily meant to catch the totality of our ethical evaluation. It would presumably aim to express one particular aspect of the normative comparison, and which particular aspect will depend on the objective features of the inequality problem"* (p. 3).

3.3. Methodological Problems

Having reviewed the theoretical issues related to the meaning and the measurement of inequality, we now have to look into some conceptual problems of variable definitions, which are also related to the initial question "inequality of what". These issues arise in an empirical investigation of economic inequality under the restrictions imposed by the statistical limitations. In this section, conceptual issues related to the definitions of economic variable, demographic unit of analysis, time period over which measurement takes place, as well as the way in which demographic units of different size are weighted in order to be compared, will be discussed. Moreover, issues such as the implications of alternative variable definitions on the measurement and analysis of inequality, and the comparability of different data sets that arise will also be examined.

i. The economic variable of interest

The first crucial question in an empirical investigation of economic inequality is how to define the economic variable of interest or, in other words, how to define a "more comprehensive" index that represents a person's well-being in society (Cowell 1995). The definition given by Jenkins (1991a) is that "*the study of economic inequality is the analysis of differences across the population in access to, and control over, economic resources*" (p. 4). This represents probably the most broadly accepted and widely used definition in the relevant studies of economic inequality. If we follow this narrow definition of well-being as a person's command over the economic resources, and taking into account the statistical limitations, three alternatives have to be considered: income, expenditure, and wealth (see Jenkins 1991a, Atkinson 1983). Figure 3.1 illustrates the association between these alternative concepts, which present the annual economic statement of a hypothetical person (see Atkinson 1983).

When our interest focuses on "the level of living", consumption seems the most natural variable because it "*...represents the purchasable benefit that a person enjoys*" (Atkinson 1983, p.37). The difference in the preferences of the consumption patterns of two persons with the same income may be significant in considering them poor or rich. Or, the decision of a millionaire to save all the money she/he earns might result in considering her/him poorer than someone with a low income who prefers to consume instead of saving. In this case, income seems to be a more appropriate variable because it represents the potential spending power rather than the actual consumption. As Ringen (1991) has argued, "*it is significant that the consumption value of income depends on the consumption it can buy and not on the consumption that in fact bought. If one person chooses to save half of his income and another*

person to spend all of his, they are still equal in welfare terms if they have the same income" (p. 2).

FIGURE 3.1: Economic statement of a person in a year.[6]

	Earnings
	+ *Investment income*
Flows	+ *Transfer income*
	+ *Capital receipts*
	= ***Pre-tax Income***

	- *Taxes*
	- *Social security contributions*
	= ***Disposable Income***

	- *Expenditure*
	- *Capital transfers*
	= ***Savings***

	+ *Wealth at beginning of year*
Stock	
	=***Wealth at end of year***

How sufficient is income for analysing economic inequality? According to Piachaud (1987), income is just an outcome and, therefore, it is alone inadequate as an indicator of welfare. When focusing on income, we tend to generally ignore certain qualitative and quantitative aspects of the work needed to earn this income. Sen (1992) also argued that *"the extent of real inequality of opportunities that people face cannot be readily deduced from the magnitude of inequality of incomes, since what we can or*

[6] This figure is based on the diagrammatic illustration of the economic statement of a person,

cannot do, can or cannot achieve, does not depend just on incomes but also on the variety of physical and social characteristics that affect our lives and make us what we are [...] The problem does not arise only from the fact that income is just a means to our real ends, but (1) from the existence of other important means, and (2) from interpersonal variations in the relation between the means and our various ends" (pp. 28-29). The differences between income inequality and economic inequality are also discussed in Sen (1997b). He noted that, although in economic literature economic inequality and income inequality are often considered as "synonymous", income inequality provides a "very inadequate and biased view" of the economic inequality in a broad sense.[7]

If income were to be chosen as the economic variable, the next question would be which is the most appropriate concept of income. Two concepts of income are frequently used in relevant studies: gross income (or pre-tax income) and disposable income (after tax and social security contributions).

Generally, the definition of gross or pre-tax income is the sum of incomes from employment and entrepreneurial activity (including self-employment), property income, occupational pensions, state and private cash transfers and all the other cash incomes.[8] As indicated in Figure 3.1:

Pre-tax income = earnings + investment income + transfer income + capital receipts.

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presented in Atkinson (1983, p. 36).

[7] According to Sen (1997b), *"the argument of shifting our attention from income inequality to economic inequality relates to the presence of causal influences on individual well-being and freedom that are economic in nature but are not captured by the simple statistics of incomes and commodity holdings"* (p. 398).

[8] This definition of pre-tax income is relevant to O'Higgins' et al (1990) concept of Gross income, to the United Nations' (1977) concept of total income and Sawyer's (1976) concept of pre-tax income.

Disposable income is obtained by deducting direct taxes and social security contributions from gross income.[9] As indicated in Figure 3.1:

Disposable income = gross income – income tax - social security contributions.

Disposable income seems to be closer to the meaning of potential, as well as actual spending power. As Hagenaars (1986) has pointed out, *"...it is after-tax, rather than pre-tax income that is perceived as command over resources by most households"* (p. 68). On the other hand, as Atkinson (1983) has also pointed out, the before tax income is more relevant as a measure of the status which a person has in one particular society, since it represents how a person is valued by the society in comparison to others. This argument may, of course, be subject to criticism. Social security transfers and taxes are basic institutions in the structure of society and, therefore, they also reflect the way in which society values a person. Both before tax and disposable income are often used as an indicator of the redistributive effect of certain government policies and interventions, mainly through taxation and social security systems. For this reason, the concept of original income has also been proposed and often used (United Nations 1977, Beckerman 1979). This is the income before direct taxes, social security contributions and state transfers (and National Insurance pensions).[10] This, of course, may sometimes lead to a dangerous simplicity as far as the role of government policy in the redistribution of income is concerned. Government is in many ways involved in how income is distributed by creating incomes or through providing public consumer goods or by consuming goods, provided by the private sector, and so on (Karantinos 1990).

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[9] This is similar to Sawyer's (1976) concept of post-tax income and United Nations' (1977) concept of available income.

[10] See also Layard et al (1978), O'Higins et al (1990).

Arguing in favour of gross income, O'Higgins et al (1990) pointed out that *"the use of gross income as the first main income concept avoids these difficulties by allowing prior elements of income to be examined in terms either of their own distribution or of their contributions to gross income in different parts of the distribution, without making any assumptions about what the distribution might otherwise have been"* (p. 24). The use of pre-tax income, especially when used to compare different countries, is not, of course, free of problems. Pre-tax income is affected by differences in the balance between employer and employee, social insurance contributions, and payroll-taxes in different countries. Therefore, O'Higgins et al (1990) have also added that *"...the balance between direct and indirect taxes may therefore affect the explanation of the net cash data, but not their accuracy as measures of the distribution of spendable income in different countries [...] whilst comparisons of gross and net cash income are only limited and qualified measures of the impact of taxation, the net cash measure clearly portrays an important stage in the process of income distribution"* (p. 24).

As previously mentioned, income could be seen as a better indicator of the potential consumption power of one person. But how accurate is income as an indicator of potential consumption? The consumption of a person depends also on health, education services, public nurseries and so on, provided by the state, from which benefit is derived, especially for the low-income population. Similarly, there are money gifts, production for own consumption, income in kind and so on, which also affect peoples' purchasing power, sometimes significantly. These elements, as

Ruggles (1990) argued, could result in consumption levels of certain population parts being considerably higher than their income levels. In addition, as Morgan (1965) pointed out, there are income elements, such as childcare and housework, that are created and consumed within the household, which are difficult to estimate. These income elements vary considerably between households and could, therefore, affect significantly any measurement of inequality. Yet, as Atkinson (1990) wrote, *"conversely, income may over-state the level of living. This may happen where money alone is not sufficient to buy the necessary goods, as where there is rationing, or availability of goods. An obvious implication is that one would have to be careful in making comparisons across countries with different market structures, particularly with regard to housing"* (1990, p.7).

Another problem related to the use of income in an empirical investigation of inequality is the narrow concept of (money) income, which is usually used in available statistics. Following Simons' (1938) definition, *"personal income may be defined as the sum of: 1. The market value of rights exercised in consumption and 2. The change in the value of the store of property rights between the beginning and the end of the period"* (p. 50). As mentioned by Atkinson (1983), this comprehensive definition of income is not reflected in income distribution statistics. Components of income, such as capital gains, fringe benefits, production for own consumption, imputed rent and so on, are generally excluded or significantly underestimated. These components, according to the social structure of the society of interest, may have significant implications for the reliability and comparability of results. In Greece, for example, according to estimates based on Family Expenditures Surveys, the production for self-consumption in agricultural households represents more than 10% of the total

household consumption (Karantinos 1990). Thus Townsend (1979), among others, argued that there is a need for a broad income-based concept which would include the non-cash income.

Although wealth is rarely used, mainly because of the scarcity of available statistics, it would be wrong to ignore its importance for a person's power over economic resources. As Le Grand et al (1992) have pointed out, *"...income is the increase in purchasing power over a given period of time, while wealth is the amount of purchasing power at any given moment..."* (p. 184). Moreover, the influence of wealth on a person's social and economic status must be stressed. At the same time, wealth provides a feeling of security and the possibility of being less dependent on short-term opportunities for work. It also determines one's opportunity to choose among jobs with different monetary and non-monetary gains (Bowels 1972). Finally, wealth is considered a crucial factor in the intergenerational transmission of inequality (Brittain 1978). Overall, wealth is quite unequally distributed. According to Atkinson (1974), during the period 1963-67, 1% of the richest population in Britain owned more than a quarter of the total personal wealth of the country. In 1992 the proportion of marketable wealth that belonged to 1% of the richest population was reduced to 18%, while 10% of the population was found to own almost half of the wealth (Joseph Rowntree Foundation 1995).[11] Of course, it is quite difficult to make realistic estimates concerning peoples' wealth, mainly because there is only limited information provided by the relevant available statistics and with substantial error (Atkinson 1974, Wolff 1991). This is the reason why wealth is only rarely used in

[11] The Gini coefficient for the distribution of wealth in the United Kingdom in 1992 was estimated to be 0.66, while the relevant estimate for the distribution of income (based on Economic Trend series) did not exceed 0.36 (Joseph Rowntree Foundation 1995). This indicates how unequally wealth is distributed.

empirical investigation of inequality (see Atkinson 1973, 1974, Wolff 1980, 1991, 1992).

This raises the question of whether incomes from various sources can be weighed equal in analysing economic inequality. To illustrate this point, if A has the same income as B and A's income comes from salaries while B's income comes from property, could one consider them equal in welfare terms? If both are of working age, the potential income of B could be considered higher if we took into account his/her potential working hours. The same principle applies in the number of hours that each demographic unit (household, individual etc) spends on earning a particular amount of income from a certain source. Piachaud (1993) has stressed the need to take the factor "time" into consideration. Lack of time influences a number of home production activities, for example food preparation, which could be considered as potential income. Additionally, certain qualitative and quantitative aspects related to the work needed for obtaining this income are also considered crucial in understanding and assessing inequality (Piachaud 1987). As Piachaud (1993) has argued, income *"...fails to discriminate between those who may choose to take a low income and enjoy more leisure (either for sleeping or for home activities) from those who may get more income but enjoy less leisure [...] We would like to know opportunities - we only know outcomes"* (pp. 112-113).[12]

Overall, there seems to be an endless number of potential concepts and variables that could be used as an economic variable in analysing inequality. Each of them represents a certain notion of inequality and could be used for capturing particular

[12] See Piachaud (1987) for a further analysis of the importance of "opportunities" in understanding

aspects of the issue, and for meeting different needs for comparisons. As pointed out by Jenkins (1991a), *"...one's choice will depend on the particular purpose at hand. In practice one is often also constrained by what is included in the statistics available. This must be taken into account of when drawing conclusions"* (p. 6).

ii. The Time Period

The next important issue requiring clarification concerns the length of time that is the most appropriate for income to be measured.[13] This time period may be a week, a month, a year, a decade or a whole lifetime.

At a first glance, lifetime income seems to be the most appropriate indicator of the total welfare of a person, and is the one usually proposed by conventional economists. As von Weizsäcker (1978) argues, *"all consumption decisions in the lifetime of a decision maker are made with the same marginal utility of money as the representative of opportunity costs of consumption. The welfare of a person [...] is not determined by his current income but rather by his lifetime income"* (p. 101). Similarly, Layard stresses the importance of lifetime income in welfare comparisons.[14] The definition of lifetime income is the net present value of all incomes received during different periods in life.

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inequality. See also Barr (1993).

[13] In the rest of this chapter, the use of the term income, in discussing issues related to other variable definitions, often refers to the "economic variable" in general, and not to a strictly defined concept of income.

[14] This comment was made by Layard in discussing a paper by von Weizsäcker (1978) on "Annual Income, Lifetime Income and other Income Concepts in Measuring Income Distribution" which was presented at a conference held by the International Economic Association Noordwijkaanzee in the Netherlands at 18-23 April, 1977. The above discussion is presented by Krelle and Shorrocks (1978). The importance of lifetime income is also stressed in Layard (1977).

The adoption of lifetime income rests on the assumption that the decision-maker is fully aware of the alternatives that s/he will have in the future. Thus a person, who has a low income and expects her/his income to increase in the future, can borrow in order to increase her/his current consumption now and to repay later. In reality, the ability of a person to borrow depends significantly on her/his current financial situation. *"The millionaire whose shares have fallen in value may not be too worried if he feels confident that they will rise again later, but the manual worker whose plant is put on short-time may be quite unable to borrow in anticipation of better times ahead"* (Atkinson 1983, p. 42-43). Sen also argues that the transfers between different points of life are not without cost and it is unacceptable to ignore that in real life there is uncertainty about the future.[15] He also suggests that there is inequality at any point in time and this must be reflected in the inequality measures. Another practical difficulty in estimating lifetime income is related to the restrictions imposed by the available statistics.[16] Thus, as pointed out by Piachaud (1993), lifetime income *"...is hard to measure until someone has died"* (p. 113).

Of course, choosing very short time periods, such as a week, results in an increase of the observed dispersion. Weekly income may vary significantly because of the weather or season (fishing, agricultural activities, tourism). It is obvious that the income of a farmer will have higher fluctuations over time and thus the weekly or even the monthly measurement of income will not correspond to his actual standard of living. In the case of full-time employees, these fluctuations are expected to be considerably lower. Thus overall the fluctuation of weekly income is expected to be

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[15] This critique was made by Sen in discussing a paper by von Weizsäcker (1978a) (see footnote 14).

[16] See Creedy (1992) for a review on the problems related to the estimate of lifetime income and on

higher than the fluctuation of monthly or yearly income. The shorter the period chosen, the higher will the observed inequality be (Atkinson 1983, Jenkins 1991a, Piachaud 1993).

The choice of length of period in which income is measured depends, of course, on the objectives of each particular study. As Atkinson (1990) wrote, *"if income is being used as a proxy for consumption, then we may wish to take permanent income rather than current income, so in particular terms annual income may be a better indicator than income in a week or a month. The choice of time period for income depends in this case on matters of fact. How far are there important seasonable fluctuations? How far can people in reality borrow to tide their families over bad times?"* (p. 8). Additionally, the time period to which the measurement of income refers, is often not directly related to the objectives of a certain study, but imposed by the limitations of available statistics.

From a policy perspective, the choice of time period in measuring inequality is also of great importance. For example, the allocation of the necessary funds for unemployment benefits or income support might need to be based on information concerning inequality in short periods, such as a weak or months. A large proportion of low-income population lives on a week to week basis. It is not, therefore, safe to assume that these people are able to finance their needs for consumption from the savings of the past or from the income that might be gained in the future. On the contrary, in formulating policies related to income taxation, information on inequality in longer periods, such as a year, is far more significant (Atkinson 1983, Piachaud

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the alternative approaches suggested in order to overcome these problems.

1993). Similarly, it has been argued that the assessment of the distributional impact of certain government policies, such as taxation and income transfers, needs to be based on information concerning the inequality of income measured in a period longer than a year (Creedy 1992). As Atkinson (1983) pointed out, *"we can, however, use different periods for different purposes. If we are measuring the number of people in poverty, and if it is correct to assume that averaging is difficult for low-income groups, then we may be concerned with weekly income. We would want to know how many people have incomes in a particular week that are below the prescribed minimum, independently of the fact that in two months' time they may be much better off. On the other hand, if we are concerned with the distribution of income among the population as a whole, we may feel that income averaged over a year is more appropriate"* (p. 43).

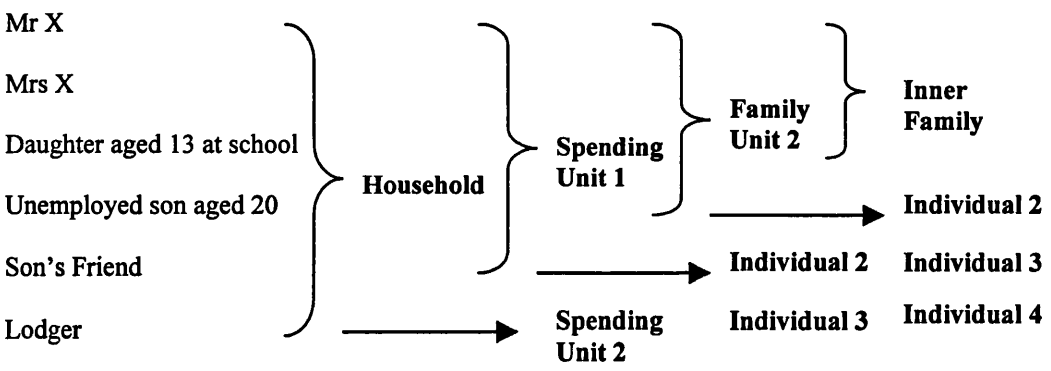
iii. The Demographic Unit of Analysis

Another important issue that needs clarification in investigating economic inequality is related to the demographic unit of analysis. Which demographic unit is considered the most appropriate? How does the choice of different demographic units influence a particular analysis? How is this choice related to the specific objectives of each investigation?

So far in our analysis, we have assumed that the demographic unit of analysis is the individual. Indeed it seems that the individual is the natural unit of analysis concerning the measurement of welfare. Most conventional economists would probably argue strongly in favour of this view. Bearing in mind that our key interest is the investigation of differences in "standard of living" or in "well-being", we have to

admit that individuals without money income, like children, often enjoy a high standard of living, because they share the income of other individuals (i.e. parents) (Atkinson 1983, Jenkins 1991a). Therefore, even if we consider the individual as a unit in welfare comparisons, in assessing her/his actual and/or potential standard of living we need to take into account some information related to the broader common living unit where s/he belongs. Following Atkinson (1990), we will diagrammatically present a hypothetical figure of alternative demographic units, which could potentially be used in analysing income inequality, and which also illustrates the relationship between them.

FIGURE 3.2: Alternative demographic units of analysis



Source: Based on a figure presented in Atkinson (1990).

In analysing income inequality, the choice of income unit is usually between a common living unit such as the household or the family, and the individual. The main idea that lying behind the choice of family or household is based on the fact that, to

some extent, the members of these aggregate units generally pool their incomes, and share common facilities (Danziger and Taussig 1979). Similarly, incomes from certain sources, such as social security (i.e. family allowances), might depend on family or household composition (i.e. number of children).

Of course, the choice of household or family as the income unit is based on the hypothesis that all members have the same "standard of living" and/or enjoying the same welfare. By adopting also an aggregate unit, we avoid difficult issues of allocation of resources among the members of the household. This is, of course, a simplicity because - given the information available - it is difficult to investigate the intra-household inequality or to have a clear estimate on intra-household transfers.

How safe is to assume that all members of an aggregate unit are sharing the same standard of living and enjoying the same level of welfare? This assumption does, to some extent, look realistic when we refer to family units. A usual pattern is husbands and wives sharing their incomes and supporting their children. On the other hand, it is not safe to assume that there is a perfect pooling of resources in all families, or that all the family members are enjoying the same standard of living. The way in which family members are sharing their income or their consumption could vary significantly from family to family. These patterns could vary largely between different population groups or regions (and definitely countries), since the living and consumption patterns reflect also the particular structure of each society. These differences, of course, are far more problematic for the inequality analysis when we refer to a broader definition of common living unit, such as the household.

During the past years, a number of researchers have investigated the distribution of resources, as well as the inequality and poverty within the household (Sen 1984, Millar and Glendinning 1987, 1989, Behrman 1989, Haddad and Kanbur 1990, Jenkins 1991b). Millar and Glendinning (1987), for example, discussed the issue of gender inequality and argued that the use of family or household as the unit of analysis does not allow existing substantial inequalities between women and men to be revealed.

In the empirical investigation of economic inequality, and particularly in those studies focusing on cross-national comparisons, it is aggregate units, such as the household or the family, rather than individuals that are more often used as the income unit (see Buhmann et al 1988, O'Higgins et al 1989, Deleeck et al 1991, Gardiner 1993). Despite this, the different social structure and consumption patterns of common living between countries - which affect the way that resources are shared within the household members - have to be seriously taken into account when drawing conclusions.

Apart from certain cultural reasons, the pattern of common living units and the way that these units are formulated (and, consequently, also their size and composition) in each society, may well reflect the economic situation of their members and/or the particular society. Thus if an adult became unemployed s/he might consider living with her/his wealthy elderly parents and benefit from the sharing of their resources. Similarly, during an economic recession (or in a poor country), when the purchasing power of individuals' income becomes low, people might consider living in larger aggregate units and, therefore, benefit from the economies of scale in consumption.

From a policy perspective also, the choice of demographic unit in the analysis of inequality is considered of particular importance in formulating and implementing particular policies. First, it is obvious that choosing a certain demographic unit will result in an increase or decrease of the observed dispersion (Piachaud 1993). The larger the income unit we choose, the lower the inequality we observe. From a general social policy view for instance, this could have a great impact on defining needs and targeting groups, on formulating and implementing certain policies, and on assessing the consequences of these policies.[17] A second relevant issue concerns the independence of individuals from certain common living units (such as family or household) for being entitled to certain allowances. As Piachaud (1993) pointed out, it is probably not important whether certain family allowances (i.e. benefits for children) are paid to either parent, on the condition that the income unit considered is the family. However, if the income unit considered is the individual, the implications are very different.[18] Of course, similar arguments on the impact of the chosen income unit could also be applied when considering other state policies (i.e. taxation).

In sum, as Piachaud (1993) wrote, *"it is hard to see that there can be absolutely right or wrong definition of the appropriate unit but it must be recognised that the definition determines how much inequality of income is revealed and it determines the impact of particular policies on that distribution"* (pp. 109-110).

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[17] As Layard et al (1978) pointed out, *"... even if Granny is saved from poverty because she lives with her son, she ought not to have to live with him in order to survive"* (p. 6).

[18] Piachaud (1993) also recognised that dependence of women in Britain is reinforced by the

iv. Equivalence Scales

So far, we have discussed some issues related to the impact and limitations of the choice of alternative income units in analysing inequality. It was argued that even by considering the individual as the unit of analysis in welfare comparisons, we need information about the specific broader aggregate unit to which s/he belongs. We also encounter the difficulties associated with the allocation of resources within certain aggregate units in assessing the standard of living and the well-being at an individual level. The question that emerges is how we can obtain comparable indicators of the standard of living, which take into account the differences in composition of certain aggregate income units.

A simple way to do this, a way adopted by a large number of studies so far, is to calculate the incomes per capita. This is based on the assumption that all members of an aggregate unit have the same needs and that there is a perfect sharing of the resources. In that case, differences in needs and in consumption by age or sex, as well as economies of scale in consumption within the household, are not taken into account (Piachaud 1993, Ringen 1991, Atkinson 1983, Deaton and Muellbauer 1980). As Ringen (1991) argued, *"a family of four, for example, rents one and not four houses, yet this one house provides housing services to all four family members. Except for single person households, the aggregate consumption value derived from the household's disposable income is higher than the disposable income per head"* (p. 3).

An alternative option, adopted by other relevant studies, is simply to use the total income or consumption of the aggregate unit (i.e. household). In this approach it is

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Beveridge plan, since this plan is based on the family unit.

assumed that there is an equal weight to each household, regardless of its size and composition. Households, therefore, with different size or composition, which have the same income, are considered equal in welfare terms and, consequently, it is also assumed that their members enjoy the same standard of living. In this case, the welfare of a household member is weighted inversely to the size of the household (Danziger and Taussig 1979). As Danziger and Taussig (1979) argued, *"the pooling of income by family members, however, does not mean that each family unit should be given an equal weight in the construction of the size distribution. In fact conventional size distributions that weight each family unit equally violate the requirements for individualistic social welfare functions because they implicitly weight the welfare of an individual inversely to the size of the unit in which he or she lives"* (p. 366).

It is obvious that each of these two approaches could alter the observed inequality with apparent policy implications. As Kuznets (1976, 1982) pointed out in his work on the demographic characteristics of income distribution, the size of household is positively associated with the total household income and negatively with the per capita income. Thus using total household income, high-income branches will appear to have larger households with many members, whereas if we use per capita income, they will appear to have households with a few members. Similarly, Datta and Meerman (1980) showed that by using total household income, income inequality is usually overestimated.

Therefore, there is need for an approach that could overcome the drawbacks of the previous two ways and could take into account the different needs of, as well as the economies of scales in consumption between aggregate units. In order to overcome

the problem of comparability of the standard of living between aggregate demographic units of varying sizes and composition, we have to set an equivalence factor (O'Higgins et al 1990). This equivalence factor is known as equivalence scale.

According to Tsakloglou (1988), three main approaches dominate in the construction of equivalence scales (see also Atkinson 1983, Buhmann et al (1988), Bradbury 1989, Jenkins 1991a, Tsakloglou 1991, Cowell and Mercader-Prats 1997):[19]

- Those based on nutritional needs of persons according to their age and sex.
- Those based on responses of the members of the aggregate unit (family or household) when asked to estimate preferences.
- Those based on estimates of the observed expenditure patterns and income of the households.

In practice, a number of different equivalence scales have been used. The choice of a particular equivalence scale may have a significant impact on the results of such an analysis, as well as on cross-national comparisons (Buhmann et al 1988, Cowell and Mercader-Prats 1997). The policy implications, therefore, of using certain equivalence scales are apparent. The impact of alternative equivalence scales in analysing inequality is also questioned in Chapter 5 of this study.

Having shown the need for using equivalence scales, the next question arising is how to weight different aggregate units. If we consider as Y the income of an aggregate

[19] Of course, not all researchers have adopted this exact classification. Different authors have proposed also different categorisations of equivalence scales. For example, Buhmann et al (1988) identified two main types of scales: those developed using experts' general knowledge and those developed empirically using information from surveys. Each of these two categories has also been classified in two subcategories according to the objectives of the analysis.

unit (i.e. household), n the number of the members of this unit, and n^* the number of equivalent adults then - having agreed that the equivalent income of this unit is Y/n^* - we face three main alternatives. First, to consider the aggregate unit as one unit, second, to consider it as comprising n units and, third, to consider it as n^* units (Danziger and Taussing 1979, Atkinson 1983, Jenkins 1991a).[20] Of course, the choice of each of these alternatives is expected to affect the number of cases in each income bracket and, consequently, the result of each measurement of inequality.

The arguments for using the "equivalent adult" or the member as the unit of analysis are based on the fact that welfare is related to individuals and thus the interest is focused on the standard of living of each member with the given income (Danziger and Taussig 1979, Cowell 1984, Jenkins 1991a, Ringen 1991). Danziger and Taussig (1979) suggested that *"... persons are the optimal choice for weights"* and argued that *"to be consistent with individualistic social welfare functions, equal weight must be given to each person's income"* (p. 374). On the other hand, the arguments for considering household or family as one unit rely on the assumption that the welfare of an individual level depends on the aggregate unit where s/he belongs.

Needless to say that the concept of "equivalent adult" as the unit of analysis can be strongly criticised. As O'Higgins et al (1990) pointed out *"...equivalent adults do not exist unlike families or individuals although a family or an individual may have*

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[20] Overall, Atkinson (1983) described nine possible ways to value and weight the incomes and the units: *"There are, in fact, several possible procedures. Suppose that the income of a family (or household) is Y and that the family has n members. Then we could treat the family as 1 unit with income Y [...] or as 1 unit with income (Y/n), or with income (Y/n^*), where n^* is the "equivalent" number of adults. On the other hand, we could treat the family as n units, each with income (Y/n), or each with income (Y/n^*). Finally, we could treat the family as n^* units, with again three possible measures of income"* (p. 52).

equivalent income" (p. 26). On the other hand, considering the "equivalent adult" allows us to rate differently each member, according to certain individual characteristics (i.e. age and/or sex). Additionally, using the "equivalent adult" as the unit and considering each with equivalent income Y/n^*, means that the total income of the family or household – and, consequently, the total income of the population in question - will remain on its actual level.[21]

Overall, as O'Higgins et al (1990) argued, *"if the family is to be treated as one unit, measuring the distribution of Y/n^* (each a variation on individual income), tells one something about the economic differences between families, but begs the question of the number of people affected by those differences. If the family is treated as n units, there is no real basis for assuming that each has an income of Y, since this measures neither the income nor the standard of living available to each of them"* (p. 26). [22]

Although the need for using equivalence scales in measuring and analysing inequality seems to be well defined and largely accepted by researches in the field, there is still some controversy over the particular scale that has to be used in each analysis. Each of the alternative methods proposed for constructing equivalence scales is based on particular concepts of inequality that reflect certain value judgements and represent certain normative aspects, as previously discussed. Despite the sophisticated techniques that have been developed, it is hard to consider any equivalence scale as

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[21] Considering that an aggregate unit i, with income Y_i, having n_i^* equivalent adults each with income $\frac{Y_i}{n_i^*}$ then: $\frac{Y_i}{n_i^*} \times n_i^* = Y_i$.

[22] However, based on empirical data for the United Kingdom, O'Higgins (1985) found that there is little difference in the total inequality observed using equivalent income per family or per individual.

objective and neutral, since it is based on certain concepts that are normative. As Cowell and Mercader-Prats (1997) argued, *"... it is fanciful to suppose that equivalence scales can be constructed without the introduction of fundamental value judgements"* (p. 30). Piachaud (1993) also pointed out that *" it is very doubtful if any objective, non-judgemental scale can ever exist"* (p. 111). Different scales, of course, could lead to different results on inequality measurement with substantial policy implications. Not only the choice of equivalence scale, but also the weighting of different income units could largely affect the analysis of inequality and the results of each measurement.

3.4 Conclusions

The analysis of this chapter was driven by the need to clarify certain theoretical and methodological issues that one faces in assessing and analysing economic inequality. It also pointed out the limitation of concepts, definitions and measures used by any inequality study. The issues discussed are directly related to the initial question of "inequality of what", which is central to any inequality exercise.

Certain theoretical issues related to the meaning of inequality were initially discussed. This discussion stressed the dual nature of the concept of inequality, as descriptive and prescriptive, which in turn affects any analysis. It was argued that we cannot have a value free meaning of economic inequality. Each adopted concept and definition of inequality introduces certain value judgements about choices, needs, fair or unfair allocation of resources, just or unjust distribution and so on. Thus the adopted

concepts and definitions in any inequality exercise refer to a certain normative concept of "equality" which is associated with particular schools of thought (theories of social arrangements). The choice also of the "focal variable" in the analysis of inequality is not neutral, but is directly associated with the particular theoretical framework and the tasks of each analysis. Thus the objectives, the research questions, the hypothesis tested and the methodology followed in each study are largely determined by the concept of inequality adopted, even if it is not always declared clearly. The dual nature of the concept of inequality is also reflected in the used measures. Each of the proposed inequality measures introduces, explicitly or implicitly, certain value judgements and refers to a certain concept of social welfare. Therefore, in an empirical investigation, the use of certain inequality measures does not necessarily reflect the inequality in a more coherent way, but it often reflects a particular aspect of a normative comparison based on certain objective features.

Restrictions and barriers to analysing inequality are also raised by the concepts and variable definitions that are adopted under the restriction imposed by statistical limitations. The relevant issues discussed in section 3.3 mainly focused on the economic variable, the length of time for income to be measured, the demographic unit of analysis, and the way in which certain units of different size and composition can be compared. It was shown that a number of alternative concepts and definitions can be used, each one referring to a particular meaning of inequality and focusing on certain aspects of the issue. It was also shown that different definitions and concepts could significantly alter the results of any investigation and meet different needs for comparisons according to the tasks put forward by each particular study.

From a policy perspective, the significant impact of the concepts and variable definitions used in analysing inequality is apparent. In particular, from a social policy view, what was stressed was the large effect that the different concepts and variable definitions have on defining needs and targeting groups, on implementing certain policies, as well as on assessing the consequences of these policies.

The analysis and the questions that emerged in this chapter provide the framework for developing the methodology, the concepts, and the variable definitions of the present study as described in the following chapters and in particular in Chapter 4. This chapter will hopefully help the reader to better understand the objectives of this present research, as well as the limitations of this analysis as it unfolds. A number of aspects that are investigated and of hypotheses tested in this study are rooted in issues and questions that have emerged from this discussion. Among these aspects, one could distinguish the impact of the alternative equivalence scales on the observed inequality, the role of information on certain income sources in assessing and understanding some aspects of the distribution of income, the use of different income concepts in evaluating the distributional impact of certain government policies, and the use of alternative inequality measures in capturing particular aspects of the issue. Moreover, this discussion has pointed out the narrowness and limitations of the concepts and definitions adopted and the methodology followed during the empirical investigation, in capturing certain aspect of inequality as defined by the objectives of the study.

CHAPTER FOUR

DATA DESCRIPTION, CONCEPTS AND VARIABLE DEFINITIONS

4.1 Introduction

One of the objectives of this study is to use a more comprehensive and appropriate database than those used by the relevant studies in the past in investigating the distribution of income in Greece and analysing particular aspects of inequality. This chapter presents the data used, and discusses particular methodological issues related to certain main concepts and variable definitions adopted in this analysis.

It has already been shown in Chapter 2 that the lack of suitable statistical information has placed serious restrictions in analysing certain issues of inequality in Greece. On the other hand, only limited use has been made of the data provided by the two surveys conducted by the National Centre for Social Research (EKKE) in 1985 and 1988, which had been specially designed to collect detailed information on a variety of issues on economic and social inequality in Greece. The full data sets of these surveys are not available, since the necessary data organisation and cleaning had not taken place by the time the present analysis was completed. In order to provide an output suitable for analysing particular aspects of inequality, this study utilises the

data of the 1988 survey, which was conducted by EKKE within the framework of the Second European Anti-Poverty Programme (EC project) (Deleeck et al 1991).

In the following section, a brief description of the 1988 sample survey is first presented. Information is provided concerning the objectives and the purposes of this survey, the sample design and its representativeness, the type of information collected, the design and structure of the questionnaire, the method used for collecting information, the organisation during the fieldwork, and the response rates.

Despite the efforts made in the Greek questionnaire to collect more detailed information on a variety of issues, which could allow a further investigation of inequality, the design of the 1988 survey and the type of information collected were greatly influenced by the particular methodology and objectives of the EC project (Deleeck et al 1991). Therefore, the main concepts and variable definitions adopted by the EC project are also discussed.[1] This will allow readers to understand the limitations and the barriers that the collected information places in analysing inequality in Greece, and to clarify certain differences concerning the methodology and definitions adopted by the present study.

This chapter also presents the procedures followed, as well as some of the methodological problems faced in accessing the original database and revealing certain parts of the data that were found to be missing or were destroyed. Additionally,

[1] These are related to the main concepts and variable definitions that were discussed in Chapter 3.

it describes the work done for organising and cleaning the original raw data in order to calculate the variables used in this study.

Finally, we will briefly refer to some key concepts and variable definitions adopted in this analysis, as well as to some information on the calculation of the relevant variables, under the restrictions imposed by the limitations of the data used. This is also important for pointing out certain differences to other studies in the field, as well as for understanding the narrowness and limitations of the adopted definitions in analysing particular aspects of inequality. Special consideration is given to presenting the concept of the economic variable used in order to provide a clearer illustration of well-being, according to the objectives of this study. Emphasis is placed in describing the methodology followed to provide more accurate estimates of household income that would not be subject to certain drawbacks, as were the relevant estimates given by the EC project (Yfantopoulos et al 1989, Deleeck et al 1991).

4.2. The 1988 Sample Survey

The 1988 Greek survey was conducted by EKKE within the framework of the Second European Anti-Poverty Programme.[2] It was part of a large research project entitled "Poverty Indicators: Social Indicators of Social Security". The aim of this project was to pursue a comparative study on the extent and social distribution of poverty and on

[2] The members of the research team that conducted the Greek survey were Yfantopoulos, J., Balourdos, D., Fagadaki, E., Kappi, C., Kostaki, A., Papaliou, O. and Papatheodorou, C. (Yfantopoulos et al 1989, Deleeck et al 1991). Some information on the 1988 sample survey can also be found in Yfantopoulos et al 1988a, 1988b, 1991 and Papatheodorou 1992).

the adequacy of social security, on a basis of surveys of representative samples of households in seven countries/regions in the EU (then EC) (Deleeck et al 1991). The project started in 1985 by research groups from four countries/regions: Netherlands, Luxembourg, France (Lorraine) and Belgium. Ireland, Greece and Spain (Catalonia) joined the project later during the period 1987 to 1988. This project was financed partly (50%) by the EU (DGV) and partly by the individual countries (Deleeck et al 1991, Deleeck and Van den Bosch 1992).

The sampling

This survey was designed to provide a national sample from the population resident in private households. Those living in institutions - hospitals, hotels, prisons etc - were not included in the sampling frame. From the foreign population, only those households composed of members with residence permits were included.

The main principle in the design of the Greek sample was to achieve the maximum possible precision under the restrictions imposed by the limited funds and the particularly tight deadlines. Particular efforts were made to secure the representativeness and precision of the sample and to avoid biases in the selection procedure, by using an adequate sampling frame, information on the population structure, and a theoretically consistent selection technique. The designing of the sample was done in collaboration with experts from EKKE, as well as with the National Statistical Services of Greece (NSSG). A sample procedure similar to that of FESs' sampling procedure was adopted. The NSSG also provided all the necessary maps (scale 1:5000) of the selected "area units".

The unit of analysis considered was the household. The sampling frame was the 1981 Population Census. According to this Population Census, the total number of households N in Greece were 2,953,252. The general sampling fraction was 1/1000, which is generally considered sufficient for the needs and the aims of such a survey.

A two-way stratified selection technique was followed for the selection of the sample (see Yfantopoulos et al 1988b, 1991). Two criteria of classification were used in order to stratify the total population in Greece: the Regional Development Areas (YPA) and the degree of urbanisation. The country is officially divided into thirteen geographical areas. For the purpose of representativeness of the sample, the Greater Athens and Greater Salonica areas formed two separate strata. Thus the total number of households N of the population in Greece was initially divided into fifteen strata. The households in each of these fifteen strata were then divided into three strata: urban, semi-urban and rural areas.[3] Therefore, the total population $N(= 2,953,252)$ was divided into 45 (15 x 3) independent strata N_{ij}; where i = 1, 2...,15 (Regional Development Areas) and j = 1, 2, 3 (degree of Urbanisation).

Therefore, n_{ij} units were selected from every stratum of size N_{ij} where $n_{ij} = N_{ij}/1000$.

The stratification was thus proportionally allocated and, therefore, the sample was self-weighting: $N_{ij}/N = n_{ij}/n$

[3] Urban areas: Cities of 10,000 inhabitants and over. Semi-urban areas: Municipalities and communes of 2,000-10,000 inhabitants. Rural areas: Municipalities and communes of less than 2,000 inhabitants.

Since there was a lack of adequate official population registers, a direct selection of the households from each stratum was not possible. Therefore, for the selection of n_{ij} units from each stratum, a multistage indirect selection technique was adopted. First, a number of settlements (municipalities and communes) were selected randomly from each stratum. Then, a number of "area units" was also randomly selected from each settlement. The inhabited area of a block or group of adjusted blocks (usually a continuous built area) containing 50-100 households, roughly defined an "area unit".[4] Finally, five households were initially selected from each "area unit", using a systematic selection technique. The interviewers enumerated all the households of the area and randomly selected some of them according to unit sampling interval. This sampling interval was estimated on the basis of the number of households contained in the unit according to the 1981 Population Census. Therefore, the actual number of households which were finally selected from each area increased or decreased according to the changes that took place since the 1981 Population Census and thus the selected sample was adjusted to these changes.

Fieldwork

The fieldwork began with a small-scale pilot survey of about 100 selected households of the Greater Athens area at the end of March 1988.[5] This pilot-study aimed to test the questionnaire and to evaluate the interviewers' work in order to select the most sufficient teams for the main work. Moreover, it was an opportunity to evaluate the

[4] Some small villages were considered as one "area unit" each.

[5] See also Yfantopoulos et al (1988a), Papatheodorou (1992).

appropriateness of the instructions given to interviewers, as well as the efficiency of the organisation during the fieldwork.

Fifty experienced interviewers participated initially, after following a two-day intensive seminar given by the members of the research team and experts from EKKE. The aim of this seminar was to clarify the objectives and tasks of this survey and to train interviewers in interviewing methods, putting emphasis on the structure of this particular questionnaire. As part of the training, two households had to be interviewed by each trainee under the supervision of members of the research team.

The first pilot-survey proved particularly important and helped clarify many issues. First, it contributed greatly to the improvement of the questionnaire. It helped us check the adequacy of the questions, clarify the definitions used, avoid misunderstandings and inaccurate answering, choose the right codes in pre-coded questions, and minimise the number of open questions. Second, it provided an opportunity to deal with particular problems of organisation in the field and in the office. It thus helped us define the number of interviewers needed, check the sufficiency of the instructions to the interviewers, organise the teams, settle an efficient system of communication during the fieldwork, and introduce an adequate system of supervision and checking of questionnaires. Finally, it helped us to evaluate the work of the interviewers and to select the most sufficient teams.

Having reviewed the questionnaire and the organisation of the fieldwork in the light of the results of the first pilot study, a second small-scale pilot survey was carried out using a sample of 50 households in the Greater Athens area and 50 households in

selected agricultural areas. Based on the findings of these two pilot surveys, the final form of the questionnaire was constructed. The selected interviewers followed a three-week special training programme in interviewing methods, as well as in the structure of the particular questionnaire. Two teams, each comprising four interviewers and one supervisor, were formed to collect information from the Greater Athens area. Six teams, each comprising three interviewers and one supervisor, were selected to cover the rest of the country.

The main fieldwork began simultaneously across the country in June 1988. The data collection was completed by the end of July with the exception of the Greater Athens area, where a large number of the selected population was absent on vacation. Those households were interviewed in September. All interviews were completed by the end of October 1988. Interviews were conducted with the head of each household. Interviewers visited people in their homes often more than once, since in case of absence the use of substitute addresses was not allowed. In case a definite yes or no answer concerning willingness to participate was not obtained, supervisors were instructed to revisit personally, explain once more the purpose of the study and deal with any concerns about securing anonymity. Also, initial refusals were treated as an indefinite answer, unless the same negative response was given a second time. The supervisors were constantly checking the work of their team. Checking was also carried out by the members of the research team, who paid unexpected visits during fieldwork. The supervisors had to report daily on the progress of their work and the location of their team.

The supervisors at the fields undertook an initial checking and correction of the questionnaires. Thus the supervisors were responsible for making some obvious corrections or - in case of unanswered questions - they were obliged either to telephone or to visit the respondent (head of household) personally. A second checking was undertaken randomly by the members of the research team. When errors or missing information were detected, questionnaires were sent back to the supervisors who were responsible for seeking clarifications. Finally, each questionnaire was also checked and corrected at the coding stage before data entry.

Response

The total sample comprised 3,112 households. In 2,980 households interviews were successfully conducted, giving a response rate of 95.8% (Table 4.1). Refusal to participate, absences or listing errors were the main reasons why interviews with the remaining households were not completed. This response rate is considerably higher than it usually is in similar surveys in other countries, and also in comparison to the sample surveys of the rest of the countries in the framework of the same programme (Atkinson and Micklewright 1983, Deleeck et al 1991). Nevertheless, these high response rates are not unusual for Greece. As already noted in Chapter 2, high response rates are also monitored in Greek Family Expenditure Surveys. Also, the European Community Household Panel Survey gives similar figures of response rates for Greece (Eurostat 1996). The high response rate in this survey was, additionally, a result of particular efforts made in that direction.

TABLE 4.1: Response rates in the EKKE 1988 sample survey.

Size of Sample	3,112
Valid Interviews	2,980
Denials	104
Absences	25
Listing errors	3
Response Rate	95.8%

Source: Based on Yfantopoulos et al 1988b, 1991

Thus, overall, this high response rate can be partly attributed to the collaborative attitude of the Greek population in such endeavours, and partly to the method used by this survey for collecting information. Despite the fact that interviewers were faced with a higher degree of initial unwillingness to collaborate in the more urbanised areas, the policy of revisiting, which was earlier described, seems to have paid off. Thus we did not monitor significant differences in response rates across the country. As far as the method used is concerned, it is generally agreed that, in Greece, and in this type of surveys, personal interviews appear to have substantially higher response rates than other methods of collecting information.

The Questionnaire

When designing the questionnaire, our aim was not only to collect the necessary data for creating the variables to be used in the EC project, but also to gather information that would allow us to further investigate economic and social inequality and the

adequacy of relevant social and economic policies in Greece. Bearing in mind the scarcity of available information and statistics in Greece, this was considered an opportunity to create a sufficient database, to further investigate the above issues, within the activities and research interests of EKKE's research team.

Overall, the design of the questionnaire was mainly governed by three goals: First, to collect accurate information on a number of social and economic characteristics of the households, which would allow us to further investigate a variety of issues related to poverty, economic inequality and evaluation of relevant policies in Greece. Second, to provide information which could be comparable with that of other similar surveys in Greece (e.g. EKKE's 1985 sample survey) as well as with other surveys in the EU and at an international level. Third, to facilitate completion by the interviewers and the respondents and to assist researchers in the analysis of the collected information. Thus the length, the structure, and the format of the questionnaire had to be clear, comprehensible and easy to use by the interviewers and the respondents, avoiding vagueness and ambiguities. As already mentioned, the two pilot studies had contributed greatly to the improvement of the questionnaire.[6]

It has to be noted that particular attention was given to the collection of information on household income. That was because of the complexity of the household income in Greece. Individual and household income derives from a variety of sources. Part of this income is attributed to activities in shadow economy or to certain sources that tax

[6] An English translation of the questionnaire is presented in Yfantopooulos et al (1988a).

units are not obliged to declare to tax authorities (Tsoukalas 1986b, Negreponti-Delivanis 1991, Livada 1988).

Therefore, special consideration was given to the part of the questionnaire that concerned the individual/household income.[7] More detailed questions on a variety of possible sources of income were used in order to help the respondents be more accurate when offering their answers, and recall any forgotten information. For this reason, a number of cross checking questions were also used. In order to make the respondents co-operate, the interviewers were particularly instructed to inform households about the anonymity of the questionnaire, and to insist on obtaining reliable information about their incomes. In particular, the part of the questionnaire concerning the agricultural income was treated in a special way in order to obtain more detailed and accurate information. The income in agricultural households comes from a variety of and particularly complex activities, such as a number of different kinds of cultivation, farming (livestock), employment of the member of household in fields or other farms, rents of land or machinery and so on. At the same time, they have to face expenses and revenues as any other enterprise. Most of the respondents were not likely to have detailed farm accounts.[8] On the other hand, the above activities have a high seasonal variation, while the rewards are not always easily distinguished or expressed in money terms. Similarly, the consumption of own production has also

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[7] Although the income concept used in the project was the net monetary income, in the Greek questionnaire questions concerning the gross household income were also included, aiming to allow further investigation of the economic inequalities in Greece.

[8] As already noted in Chapter 2, at the time when this sample survey took place, agricultural households in Greece were not obliged to declare their income to tax authorities, and were generally excluded from paying income taxes and social security contributions. This was a result of the special tax allowances which were introduced in the past when the agricultural households were rather poor (Livada 1988). These allowances remained valid until recently (1994) when it became compulsory for the whole population to fill in tax reports. Therefore, only a few big farmers used to keep farm

to be taken into account since, as already mentioned, it appears to represent a significant proportion of the total household consumption among the agricultural households in Greece.

According to the type of information and data we were seeking to collect, the questions could be roughly divided into four main categories:

- Questions on social and demographic characteristics of the household members. Information included demographic, educational and occupational characteristics of all the members of the household. In addition, information was collected on the family of origin of the head of household. In case of a typical two-parent family, information on the family of origin was collected for both parents.
- Questions on economic characteristics. Information on monthly and annual income was collected, and it concerned pre-tax and after-tax income from various sources (including social security) for all the household members. It also contained data on direct taxes that the tax units of the household paid, as well as information on savings, expenditures, consumption patterns and attitudes, property and wealth, housing conditions and so on.
- Subjective evaluations. This category contained evaluations and estimates of the head of household on a variety of issues, such as the current economic state of the household, the economic state of the family of origin of the head of household, the head's current and past health and mental health state, the knowledge and utilisation of social services and provisions.

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accounts.

- Questions on the use of social services. This group of questions was mainly aiming to seek information on the access and use by the household members of a number of social services and provisions. Particular attention was given to the use and access to certain health services.

4.3 Concepts and Variable Definitions Adopted by the EC Project

At this point, it is considered necessary to briefly discuss the concepts and variable definitions adopted by the EC project, which have greatly influenced the design of the 1988 survey and the collected information. As already noted, the purpose of this EC project was to provide comparable estimates on the extent of poverty and on certain social indicators in seven countries-regions in the EU. Therefore, the adopted variable definitions and the collected information had to mainly satisfy the particular needs of this project. The discussion in this section will help the reader understand the limitations of the collected information in analysing inequality in Greece. Additionally, it will help clarify differences in the methodology and variable definitions adopted by the present study in investigating certain aspects of the issue, compared to the methodology used by the EC project. Although some of the issues that are related to alternative variable definitions have already been discussed in more detail in Chapter 3, we cannot avoid adding some brief critical comments on certain issues related to the analysis and purposes of the present study.

Demographic unit

In the EC project and, consequently, in the 1988 survey, the demographic unit of analysis was considered to be the household. The household was defined as a group of persons who live and eat together regularly and share a common budget. It was also assumed that all members share the same standard of living (Deleeck et al 1991). Although this definition has been broadly used in relevant studies, it has a number of drawbacks, which place serious limitations in the analysis of inequality and poverty, and have to be taken into account when conclusions are drawn.

It has already been noted in Chapter 3 that the assumption, underpinning the adoption of household as the unit of analysis, that all household members share the same level of economic welfare or the same standard of living, does not allow us to identify intra-household inequality. A number of studies have already stressed the significance of intra-household inequality, and have pointed out that it is a simplicity to ignore it (see Sen 1984, Millar and Glendinning 1987, 1989, Behrman 1989, Haddad and Kanbur 1990, Jenkins 1991b).

This definition is also problematic as far as the comparability of the standard of living and economic inequality between different countries is concerned. The socio-economic structure of each individual country/region is reflected in the pattern of common living (the composition and synthesis of households), as well as in the intra-household transfers and welfare. Therefore, in some countries the above definition of household is closer to the nuclear family concept (one adult or a couple and dependent children) while in others this concept is broader. In Greece, it is common for "adult

children" to live with their parents until they get married. Also, it is still common for parents to live with their married children when they grow old.

Problems in comparability were also reflected in the different treatment of household members, which each individual country followed in the framework of the same project. For instance, in Luxembourg, Belgium, Ireland and Catalonia, students who did not live with their parents were considered members of their parents' family/household because they were seen as financially dependent on them, and because they usually returned to their parents' home in the weekends or during holidays. In Greece (also in The Netherlands and Lorraine), students who did not live with their parents were not considered members of the household, although in most cases they were financially dependent on them.[9] Similarly, in the Greek survey, persons who were doing their military service were not considered household members, despite the fact that in most cases they were also financially dependent on their families (parents, wives etc).

In the case of married or unmarried heterosexual couples, the man was considered to be the head of household, unless he was seriously incapacitated. In all other cases, it was the person who was generally considered to be the head of household by the other members. The fact that the man was considered to be the head of household in married or unmarried heterosexual couples is not free of problems and is subject to a

[9] This is one of the points that could be strongly criticised concerning the design of the Greek survey.

certain degree of arbitrariness. It does not necessarily reflect the structure and the living patterns of a modern common living unit.[10]

Equivalence scales

In addition to total (net) disposable income, the equivalent income is also used in this project. The equivalence scale adopted was the one used by OECD (1976) *"...which is fairly close to the geometric mean derived from a number of equivalence scales in international research"* (Deleeck et al 1991, p. 8)[11]. According to this scale, the equivalence factor for a one-member household is 0.666, for a two-member is 1.00, for a three-member is 1.25, for a four-member is 1.45, for a five-member is 1.60, and then it increases by 0.15 for every additional member.

An important criticism against this scale is that it does not take into account differences in household composition. It is based only on household size, whereas differences in age, sex and other characteristics of household members are not taken into account. In addition, the choice of a common equivalence scale does not guarantee the comparability of the results across countries. The differences in the household composition, as well as in the consumption patterns, which vary significantly between countries-regions, could have a great influence on the observed results.

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[10] Of course, even the mere reference to a "head" of household in relevant studies could be seen as problematic. The head of household could well be replaced by the notion of "respondent", when information needs to be collected by one household member only.

[11] Although this equivalence scale was used in presenting the distribution of disposable household income and in calculating the subjective poverty lines, the equivalence scale adopted by O'Higgins and Jenkins (1990) was used for estimating the EC poverty line. According to this scale, the first adult weighted 1, each additional adult 0.7, and each child 0.5.

Concept of income

The income concept used in the EC project was the net or disposable cash household income. Its definition was the total income from various sources of all members of the household after income tax and social security contributions. Income components such as income in kind, imputed rent, production for own consumption and so on were not included (Deleeck et al 1991).

This narrow definition of income, as also noted in Chapter 3, seems problematic for comparing different states of standard of living within a country, as well as for cross-national comparisons on poverty and inequality. Differences in non-cash income such as income in kind, imputed rent, production for own consumption, which vary significantly between different socio-economic groups, could affect people's potential consumption power and thus could significantly affect any comparison of standard of living. As mentioned in Chapter 2, in Greece the consumption of own production represents 10% of the total household consumption in agricultural households.

Similarly, differences in non-cash provision and on government policies between different countries, which reflect the socio-economic structure of each individual country and the social security system, are not taken into account. Therefore, differences in provisions such as housing, education or health care may have significant influences on the well-being of the population, especially for those at the low income groups (Atkinson 1990).[12]

[12] Gardiner et al (1995) also investigated the effect of differences in housing and health care on comparison of income distribution between different countries.

Another problem arises from using only the disposable income in measuring economic inequality. It has to be noted that the target of this EC project was mainly the measurement of poverty and adequacy of social security, and not an extensive analysis of the distribution of income. This could explain why only the disposable income was chosen as an indicator of the standard of living. The arguments concerning alternative concepts of income in analysing economic inequalities were already discussed more extensively in Chapter 2. However, it is necessary to make an additional comment. The use of disposable income only does not allow the redistributive role of government policy through taxation to be revealed. As Piachaud (1987) pointed out, *"...by considering net income in relation to original income, the focus is exclusively on the net redistributive effect of government policies"* (p. 45). Also as Daniel argued in 1968, gross income is this *"...which tells people how they stand compared to others, how they are valued by their employers compared to colleagues and how they are progressing compared to similar reference groups outside the work"* (quoted in Atkinson 1983, p. 38).

Finally, a problem arises in the calculation of net income from various sources, as a result of the structure of the Greek tax system. In the studies conducted within the framework of the Second European Anti-Poverty Programme, it was impossible to estimate net income from various sources in Lorraine because of the complexity of the French tax system. Thus the results in Lorraine refer to income before taxes (Deleeck et al 1991). In Greece, although data on net income from various sources was presented, similar problems were faced. It was impossible to provide accurate estimates on the proportion of net income from each different source to total net household income. That is because according to the Greek tax system each individual

(income provider) has to pay taxes and social security contributions, which are validated differently according to the source of income and the time that s/he obtains the income. Thus, for example, in case of monthly salaries a given proportion of the salary goes every month to income tax and social security contributions. Then at the end of the year the total amount of taxes that each tax unit has to pay is calculated.[13] This total amount is related to a number of factors such as the total declared income and the property of the tax unit, the sources of income, the social and demographic characteristics of the tax unit, the total amount of tax and social security contributions that the members of this unit have already paid throughout the year, and so on. Finally, the difference between the income tax that the members of the tax unit had already paid throughout the year, and the total amount of tax that the unit is obliged to pay according to the declared income and property, has to be paid to tax authorities or to be returned to the tax unit. It is obvious that it is very difficult for each income provider or even tax unit to know exactly the proportion of tax and social security contributions that correspond to any individual source of income. Consequently, it is almost impossible to have relevant accurate estimates at a household level. Additionally, a substantial proportion of household income in Greece is attributed to activities in shadow economy or derives from sources that are generally excluded from taxation. This makes the above calculations more difficult and more inaccurate, as far as the proportion of tax and social security contributions corresponding to each individual source of household income is concerned.

Therefore, accurate estimates on how the total annual tax and social security contributions are divided into the different sources of income are impossible to make.

[13] As already noted in Chapter 2, the tax unit may be different from the household or the individual.

As a result, the relevant estimates on net income from various sources in Greece (not the total net household income) given by Yfantopoulos et al (1989) and Deleeck et al (1991), could not be considered as particularly accurate.

Time Period

In the EC project, a month was the time period basis for calculating income. As Deleeck et al (1991) argued, *"...in many countries most income wages as well as benefits are paid out once a month, so that the month is the natural accounting period"* (p. 7). It has already been noted in Chapter 3 that the choice of short time periods (month or week) results in an increase of the observed dispersion. For example, agricultural income may fluctuate significantly over the year and, consequently, its estimates may vary considerably depending on the time that the income is reported and the particular time period basis in which it is expressed. Similar issues arise in entrepreneurial or self-employment incomes. In countries like Greece, where agricultural production represents a significant proportion of the national product, short periods of reported individual or household incomes could alter the real picture of income distribution. Thus the different socio-economic structure of each individual country/region has to be taken into account, especially in cross-national comparisons. Under certain assumptions, short periods like a month or week could be considered satisfactory in measuring poverty or particular aspects of inequality (e.g. the certain minimum income level that no one should fall below at any time). However, in general terms, the use of short periods seems rather restrictive, if not problematic, in analysing income distribution. In the Greek survey, information on both monthly and annual household income was collected.

4.4 Accessing, Organising and "Cleaning" the Data for the Present Study

Although the 1988 sample survey was designed to collect detailed information on a variety of issues on economic and social inequalities, as well as on the adequacy of social policy, only some limited data sets and summary measures have been published so far, as already mentioned.[14] As pointed out in Chapter 2, at the time of this present study, the full data set was not available because the necessary data organisation and cleaning had not taken place. Only the members of the research team who conducted the 1988 survey were authorised to use and had access to this database.

Being a member of the research team that conducted the 1988 survey, I took an active part in the design of the empirical investigation, and I thus had access to the original raw data. During the period 1989-1991, I had already initiated a systematic work in organising and cleaning the original data. This work was interrupted in 1992 and it continued during the period of 1995-1998. It has to be mentioned that this work proved very time consuming, mainly because of the complexity of the income and other data concerning social characteristics, and due to the length of the questionnaire. The main aim of this procedure was to provide an output suitable for analysing the particular aspects of inequality in Greece, which would not be subject to the same drawbacks as other relevant studies in the past were.

[14] The only available variables were those created and used by Yfantopoulos et al (1989) and Deleeck et al (1991). As mentioned above and in Chapter 2, these were subject to certain drawbacks and are considered too narrow for the needs and the objectives of the present study.

The work done during the period 1989-1991 was based on the original raw data. It aimed to provide estimates on household income before taxes and social security contributions (total and by source) using the raw data of the 1988 survey. Additionally, as mentioned in Chapter 2, it also aimed to provide better estimates on disposable income and on a number of other social indicators than the estimates of Yfandopoulos et al (1989) and Deleeck et al (1991), which were subject to certain drawbacks and methodological problems. For this purpose, a number of consistency tests were first applied in order to clean the original database. Errors appeared most frequently during the data entry (when the information from the questionnaires was entered to the database). Therefore, in order to preserve the high response rate, errors were corrected using the original questionnaire. Additional consistency tests were conducted in order to clean the database during the calculations of variables of interest. As a result of this cleaning, 29 more questionnaires were excluded because of insufficient or missing information on household income. During that time, emphasis was placed in creating more comprehensive variables and better estimates on disposable household income, as well as on income before taxes and social security contributions (total and from various sources). The first results for the total country were presented in Papatheodorou (1992). As mentioned in Chapter 2, this study provided estimates and summary measures on the distribution of total gross household income by various sources, of disposable income, and of taxes and social security contributions, according to income deciles and certain population subgroups.[15]

[15] Two articles on inequality and poverty in the Greater Athens area (Balourdos et al 1990, Kostaki et al 1995) also used these initial estimates based on the part of the data concerning that area.

During the period 1995-1998, I found that the largest part of the original files which contained the raw data of the 1988 survey had disappeared or been destroyed. The main reasons for this loss were bureaucratic, but this loss may also be attributed to unfortunate circumstances: first, no one made further use of the original raw data during that time, and second, EKKE changed location and its information system was totally reorganised. Therefore, I had to pursue a systematic investigation in order to retrieve some of the missing parts of the original raw data that were crucial in constructing the necessary variables, according to the specific needs of the present study. Thus I had to search through a number of individual files that had been created during the period 1988-1991 from the original raw data of 1988. These files were created by some members of the research team in order to meet particular needs for potential research into a number of social issues in Greece. However, these individual files had never been used and, therefore, they were difficult to find. Each of them contained some parts of the original micro-data of the 1988 sample survey. With the collaboration of some of my colleagues of the research team that conducted this survey, I managed to obtain some of these files. Applying specific merging techniques, I retrieved a substantial part of the original database that was needed in order to create the variables used in this present study. The data included in these individual files was not particularly organised and cleaned. Therefore, a number of additional consistency tests were applied in order to clean the data and correct the errors. This work proved even more difficult and time consuming since the original questionnaires were not available anymore. As a result of this additional cleaning, 11 more questionnaire were found to include insufficient information on household income and were, therefore, excluded from the analysis. Thus the number of questionnaires finally used in the present study are 2,940.

4.5 Concepts and Variable Definitions in the Present Study

One of the aims of this study is to provide an output suitable for analysing the particular aspects of inequality and poverty in Greece, as they were defined by the objectives of the study. As already mentioned, special attention was given to the calculation of the relevant variables and, in particular, those of income. Alternative definitions were applied in order to take into account the concepts, the methodology, and classification used by other relevant studies and databases in the EU and at a national level, as well as by the Luxembourg Income Study (LIS) (Smeeding and Schmaus 1990) and the United Nation's guidelines (United Nations 1977). This also improves the potential comparability of the results of this study and allows further investigation on income inequalities, poverty, and the evaluation of alternative policies to combat poverty. Furthermore, the methodology used by researchers and institutes with a long-term tradition in manipulating similar databases was taken into account and it contributed greatly to the completion of this study.

In this section, we will briefly refer to certain key concepts and variable definitions that were adopted in this analysis under the restriction imposed by the limitations of the available data. These are related to the economic variable, the length of time to which income refers, the demographic unit of analysis, and the equivalence scale used in order for demographic units of different size and composition to be compared.[16] In

[16] Concepts and definitions related to a number of other variables adopted in the analysis of this study, such as the family background, the educational level, and the occupational status, will be

Chapter 3, we already discussed the significant impact of alternative concepts and variable definitions in analysing inequality. It was argued that different definitions and concepts are subject to different needs for analysis and could significantly affect the results of any inequality exercise with important policy implications. Therefore, this discussion will also help understand the narrowness and the limitations of the concepts and the variable definition adopted in analysing certain issues, as they were defined by the objectives of this study. Additionally, it will clarify the differences to the concepts and definitions adopted by other studies in the field, and in particular to those adopted by the EC project in the framework of which the 1988 survey was conducted (Deleeck et al 1991). Certain issues related to the adopted concepts and definitions will also be discussed in more detail in the following chapters.

Among the aims of this study was to provide a clearer illustration of well-being and economic status than that provided by the relevant studies in the past. The issues related to the adoption of certain concepts of income in analysing inequality were already discussed in Chapter 3. It has been argued that alternative concepts or certain elements of income could be used for capturing particular aspects of the issue and could lead to a more in-depth analysis of the observed inequalities. It was, therefore, considered necessary to provide detailed and accurate information not only on total household income, but also on income from various sources.

As previously mentioned, the concept of income used in the EC project was the net disposable household income by various sources. The relevant estimates given by Yfantopoulos et al (1989) and Deleeck et al (1991) were subject to certain drawbacks

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discussed in the relevant chapters.

and failed to provide accurate estimates on the disposable income and, particularly, on the contribution of each individual source to household income. Additionally, the sole use of the disposable household income places restrictions and barriers in investigating certain aspects of inequality in Greece, especially those associated with the objectives of this study. Thus in the present study, in addition to the total disposable household income, estimates on the distribution of income before taxes and social security contributions are also provided.[17] It was shown that it is quite impossible to produce accurate estimates on the contribution of individual sources to household disposable income, mainly because of the particular structure of the Greek tax system. Therefore, in this analysis estimates were provided on the distribution of certain individual sources of household income before taxes and social security contributions. Finally, the estimates provided on total household disposable household income vary to a certain degree form those of Yfantopoulos et al (1989) and Deleeck et al (1991). These differences can be partly attributed to the different methodology adopted in the calculation of this variable so as to overcome certain drawbacks, and partly to the additional cleaning of the original data.

The following concepts of income are used in this study:[18]

[17] Although the income concept used in the EC project was the net monetary income, in the Greek questionnaire questions concerning the gross household income were also included, aiming to allow further investigation of the economic inequalities in Greece.

[18] The concepts of income that are adopted in this analysis, and the estimates of the relevant income variables for the whole country, were based on the definitions and methodology used by Papatheodorou (1992). Some differences could be mainly attributed to the additional data cleaning that took place since then, for the needs of this study.

I. Pre-tax (gross) Income: This is the total household money income before (direct) taxes and social security contributions. Pre-tax Income is classified into six different sources:

- ***Wages and Salaries*:** This refers to incomes that the members of a household would have received if no deductions - taxes and social security contributions - had been made from their salaries/wages. In this source, special annual "allowances", as well as bonuses which employees are entitled to, are also included.[19]
- ***Entrepreneurial Income*:** This refers to gross income from self-employment, freelance occupations or business activities.
- ***Property Incomes*:** This refers to rents, interests, and shares. Imputed rent is not included.
- ***Agricultural Income*:** This refers to income that derives from agricultural activities. This is equal to gross revenues minus expenditures from any agricultural production. In this source, incomes from leasing of agricultural machinery, leasing of land, incomes from employment in agricultural activities, as well as estimations of production for own consumption, are also included.
- ***Income from Social Security*:** This is divided into two sources.
  - *Pensions:* This refers to gross primary and auxiliary (occupational) pensions, old age pensions, pensions for farmers, widow and orphan pensions and so on. Private insurance pensions are not included.

[19] According to the Greek legislation, employees are entitled to extra "allowances" from their employers on an annual basis. Thus for full-time annual occupations these allowances are equal to two months wages or salaries.

- *Other*: This refers to various Family Allowances, Maternity Allowances, Illness Allowances, Work related Illness Allowances, Scholarships for poor children, Poverty Allowances and so on.

- ***Income from Other Sources*:** This refers to income alimonies for former spouse and children, gifts in cash, remittances, fringe benefits and so on.

II. Net (disposable) Income: This is the total household income after taxes and social security contributions.

All the types of incomes used in this study are calculated on an annual basis and they refer to the year 1988. This mainly refers to cash income. However, estimates of basic components of non-cash income such as production for own consumption for agricultural households, as well as fringe benefits or imputed rent in entrepreneurial income, are also included.

The choice of annual income instead of a shorter period, such as a month or a week seems more appropriate for the particular needs and objectives of this study. The importance of the chosen time period to which income refers has already been discussed in more detail in Chapter 3. Short periods such as a month or a week increase the observed dispersions. In particular, the inequality of weekly or monthly incomes is expected to be higher in Greece, since a large proportion of people's income is attributed to activities with high seasonal variations such as in the rural sector and tourism.

The demographic unit of analysis in this study is considered to be the household. The household is defined as a group of people who live under the same roof, eat together

and share a common budget.[20] The definition for head of household is the same as the one used in the EC project (Deleeck et al 1991). Therefore, in the case of a married or unmarried heterosexual couple, the man is considered to be the head of household, unless he has been seriously incapacitated. In all other cases, it is the person who is generally considered to be the head of household by the other members.

Finally, the equivalence scale used in order to make households with different composition comparable is the scale C proposed by O'Higgins and Jenkins (1990) and recommended by OECD in its work on Social Indicators. According to this scale, the first adult in each household has a weight of 1.0, each additional adult a weight of 0.7, and each child that of 0.5.[21] The issues related to the adoption of this equivalence scale by this study are discussed more analytically in Chapter 5. It should be mentioned here that the use of this particular equivalence scale does not imply that this scale is considered to be the most appropriate. It is impossible to define an objectively ideal equivalence scale, since the weights of any scale are based on certain assumptions and subjective evaluations, violating its objectivity. One of the reasons why this particular scale was chosen is because it provides different weights for

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[20] The implications of the alternative definitions of demographic units in analysing inequality have also been discussed in more detail in Chapter 3, as well as in Section 4.3.

[21] $Y_i^* = \frac{Y_i}{n_i^*}$

and

$n_i^* = 1 + (0.7(a_i - 1)) + (0.5(n_i - a_i))$

were:

Y_i : the total disposable income of the household i,

Y_i^* : the total equivalent income of the household i,

n_i : the number of members of household i,

a_i : the number of adults of household i.

children and adults, and imposes economies of scales in consumption within the household. Additionally, it is a scale that has been frequently used in relevant studies, particularly in EU countries, and, therefore, could improve the potential comparability of the results of this analysis. Of course, we need to be aware that the adoption of one particular scale could greatly influence the results of any inequality exercise, and could have significant policy implications. Although in this analysis the equivalent income is used, estimates and summary measures on the distribution of total and per capita household income are also presented. This is done to improve the comparability of the results of this analysis and to allow us to investigate the implications of different equivalence factors to observed inequality.

4.6 Conclusions

The aim of this chapter has been to present the data used in this study and to discuss methodological issues related to certain key concepts and variable definitions adopted in this analysis. The analysis of inequality in Greece, using a more comprehensive and appropriate database than those used in other studies in the past, is one of the objectives of this study. For this reason, the present study utilises the micro-data of the 1988 sample survey, which was conducted by EKKE as part of the Second European Anti-Poverty Programme. The aim of this programme was to collect comparative information on poverty and on the adequacy of social security in seven EU countries/regions. The Greek survey was designed to provide a national sample from the population resident in private households. Particular efforts were made in order to achieve the maximum possible precision of the sample and secure its

representativenes. Unit of analysis was the household and the general sample fraction was 1/1000, based on the 1981 Population Census, which is generally considered sufficient enough for the aims of this survey. Interviews were successfully conducted in 2,980 households, giving a response rate of 95.8%, which is particularly high but not unusual in similar surveys in Greece.

Bearing in mind the scarcity of relevant statistics in Greece, the design of the Greek questionnaire was governed by the need to collect additional detailed information on a number of social and individual characteristics, which could allow a further investigation on a plethora of issues related to inequality. Emphasis was also placed in the collection of accurate information on household income. Despite these efforts, the design of the 1988 survey and the type of collected information was primarily influenced by the objectives, as well as the concepts and variable definitions adopted by the EC project. Discussion on these definitions was considered necessary for understanding particular limitations and restrictions imposed on the present study in analysing certain aspects of inequality, as defined by its objectives. Additionally, this discussion helped to pinpoint the differences in the adopted definitions and methodology in the analysis of the present study. In particular, the definition of household income adopted by the EC project was subject to certain drawbacks and is considered restricted and problematic for the needs of the current analysis. It was also pointed out that accurate estimates on the distribution of disposable household income between sources are impossible to produce, mainly because of the structure of the Greek tax system.

Although the 1988 survey provided valuable information for analysing a number of aspects of inequality in Greece, only limited use has been made of its data so far. At the time that the present study was conducted, only the members of the research team that conducted this survey had access to the full data set. That was due to the fact that the necessary data organising of the total database had not taken place. Despite the fact that I was a member of this research team, access to the original data faced many obstacles. Although during the period 1989-1991 I had initiated systematic work for organising and cleaning the raw data, a large part of the original database was found missing in 1995. A systematic investigation, therefore, had to be undertaken and specific merging techniques had to be employed in order to discover and retrieve those parts of the original data that were crucial for constructing the necessary variables for the analysis of this study. When additional data cleaning took place, 40 more questionnaires were found to contain insufficient or missing information of household income and were excluded from the analysis. This work aimed to allow us to provide more accurate estimates on household income and on a number of other individual and social characteristics that would not be subject to certain drawbacks as was the case with other studies in the past.

Finally, some of the key concepts and variable definitions adopted in this analysis were discussed in this chapter. These definitions were subject to certain limitations imposed by the data used. On the other hand, these definitions also raise certain barriers and restrictions to the analysis of inequality, which need to be accounted for when conclusions are drawn. This discussion helps clarify certain differences with the concepts adopted and the methodology followed by the EC project, as well as by other similar studies. One of the aims of this study was to provide an output suitable for

analysing certain aspects of inequality in Greece, without facing the problems and drawbacks of other similar studies. Therefore, particular attention was paid to the calculation of relevant variables and alternative definition used in order to capture different aspects of the issue, according to the objectives of this study. The concepts and methodology used by other researchers and data archives have also been taken into consideration in order to improve the potential comparability of the results and to allow further investigation on a number of issues related to inequality in Greece. In particular, emphasis was placed in the concepts and definitions of household income. This is because providing accurate estimates of well-being and economic status was among the aims of this study. Alternative concepts and certain income components were used in order to investigate particular aspects of the issue and allow a more in-depth analysis. The concepts of income used in this analysis were the total disposable household income and the household income after taxes and social security contributions. Estimates were also provided on the contribution of certain individual sources to household income before taxes and social security contribution. Thus the drawbacks of the variables used by EC project were avoided, since it is impossible to have accurate estimates on the distribution of disposable income between sources. In addition, the estimates on disposable income provided by this study varied from those of the EC project, due to the differed methodology adopted in calculating this variable, and due to the additional cleaning of the micro-data. All income components were calculated on an annual basis and refer to the year 1988. The demographic unit of analysis was considered to be the household, while an equivalence scale, providing different weights for adults and children and imposing economies of scales in consumption, was used in order to make households with different composition comparable.

CHAPTER FIVE

INCOME INEQUALITY IN GREECE:

A DECOMPOSITION ANALYSIS BY FACTOR COMPONENTS

"We have always to come face to face with a structure, not with numbers. Numbers can guide us towards the truth, but they can never represent the truth"
K. E. Boulding

5.1 Introduction

This chapter analyses the distribution of household income in Greece according to its main sources. The main objective is to provide more detailed information not only on the distribution of total household income, but also on its structure, as well as on the distribution of various income components. The analysis by income source provides an additional valuable tool for understanding and explaining a number of aspects of inequality in Greece. The structure, as well as the total income, could be also considered as social characteristics since they provide information on the status of each particular individual, household or population group in the society.

One of the issues that this chapter also investigates concerns the sensitivity of the results to the measure of income used in assessing inequality in Greece. In particular, in order to make households of different size and composition comparable, the effect on our results of the alternative scales used will be investigated and the potential policy implications will be analysed.

Emphasis will be placed in the investigation of income inequality in Greece using a decomposition analysis of inequality by income source. This analysis provides us with additional valuable information for further examination of the observed inequality in Greece, and allows us to evaluate the influences of a number of government policies for growth and development on inequality and poverty. "Development" is not a value-free term. It depends on a number of economic, social and cultural indicators and has a unique meaning for each individual country. Poverty and, more generally, inequality have been recognised as being among the most important indicators for evaluating the degree of development. After the Second World War, economies in most countries were characterised by high rates of growth, while governments appeared to have the necessary instruments and measures to guarantee these rates of growth. At the same time, according to conventional wisdom, all population groups - and in particular low-income groups – were to benefit from this continuous economic growth, thus reducing income inequalities and poverty (Kuznets 1955). Indeed, this was the case, and economies seem to have worked rather well until the mid 1970s. During that period, poverty declined rapidly in most economies and inequality was relatively stable (Joseph Rowntree Foundation 1995, Danziger and Gottschalk 1989, 1993, Karoly 1993). Thus economic policy was mainly concerned with increasing the rate of growth, which became the criterion of success. It was, therefore, believed that the

high rates of growth could also improve the other social indicators. The recent experience, even among developed countries, calls this conventional wisdom into question. Since the late 1970s, growth in a number of countries has led to a significant rise in inequality and poverty, while the poorest among the population find themselves poorer in the mid 1990s than they were in the late 1970s; not only in relative but also in absolute terms (Hills 1996, Joseph Rowntree Foundation 1995, Gardiner 1993, Johnson and Webb 1993). The relation between growth and development has again been put in doubt.

The decomposition of inequality by income components considerably improves our ability to understand and explain inequality and poverty. It may help to establish links between the functional and personal income distribution. Therefore, our ability to evaluate and predict the potential influences of particular growth policies on inequality, poverty and, consequently, on social development is significantly improved.

5.2 The Structure of Household Income in Greece: Some Summary Findings

It is important to outline some main characteristics of the structure of household income before we proceed to the decomposition analysis of inequality in Greece by income source. Therefore, in this section, some figures and aggregate estimates concerning the structure of total household income in Greece according to its main sources are presented. Since our concern is the analysis of the structure of aggregate household income and not the comparison or the ranking of households with different

composition, at this stage it is considered appropriate to use the total (not equivalent) household income before taxes and social security contributions. In 1988 the total average annual household income in Greece was found to be 1,624 thousand drachmas (which was equivalent to $10,973 at that time). As Figure 5.1 shows, the share of wages and salaries in the total household income is 39.8% and is, therefore, by far the most significant source of household income. Entrepreneurial income is the second important source (22.4%), followed by income from social security (17%), and income from agricultural activities (13.4%).[1] Overall, the primary income (wages, salaries and entrepreneurial income) represents more than 62% of the total household income.[2]

Pensions represent 98% of the total household income from social security. It thus appears that social security payments other than pensions are limited in Greece. One explanation for this is that some of the benefits for invalidity are classified in Greece as pensions (Deleeck et al 1991). Similarly, many of the family allowances and social security benefits are given as a proportion or as part of the wages and salaries or pensions and thus it is rather difficult to examine them separately (Papatheodorou 1992). Despite the efforts made in the design of the questionnaire and during the empirical investigation of the 1988 survey to extract accurate and detailed information on social security allowances and benefits, their share is - as expected - significantly underrepresented in the relevant figures. The attempts made by Yfantopoulos et al

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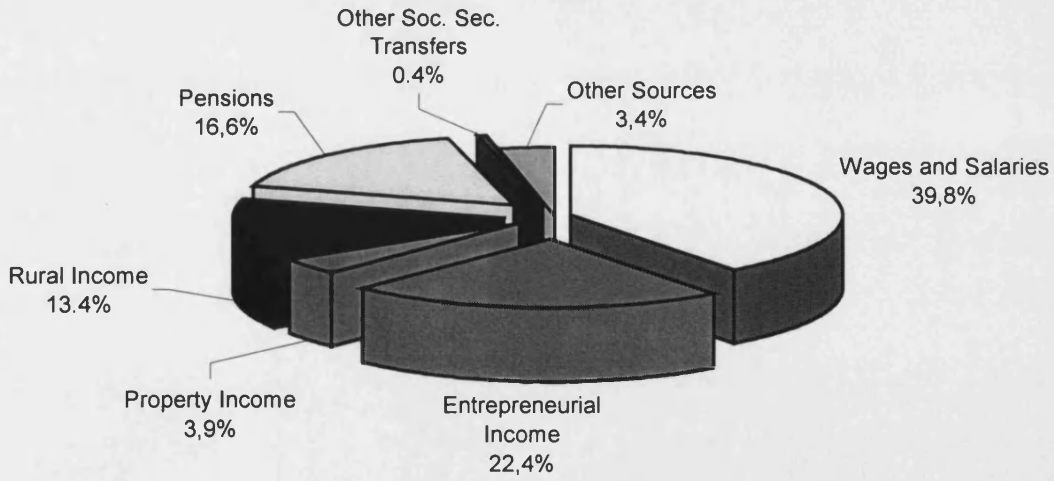
[1] The relevant figures for equivalent income (and per capita income), as far as the share of each individual source of income in the total household income is concerned, are - as expected - slightly different (see Tables 5.3, 5.4, 5.5). Of course, these small differences do not affect the general picture of the contribution of each individual source to total household income. The same comments, of course, could be made if we used the equivalent income.

[2] It has to be noted that the figure of the share of the primary income in the total household income is underestimated since, as already noted, the incomes from employment in agricultural activities are included in "rural income" and not in "wages and salaries".

(1989) and Deleeck et al (1991) to present more detailed results from the 1988 survey on the contribution of some of the individual social security benefits and allowances to total disposable household income in Greece are, therefore, not particularly accurate (see Papatheodorou 1992).[3] Thus their estimates on these figures could not be seen as a particularly reliable source of information for an in-depth analysis on the subject.

Figure 5.1: Synthesis of household income according to the main sources of income.



[3] See also Chapter 4 in this study.

These results are not directly comparable with those of other studies, since there are no other known published estimates on the structure of household income in Greece for the entire country based on similar surveys. As noted in Chapter 2, Karageorgas et al (1988) provided estimates on income distribution by various sources only for the area of Athens, based on the 1985 survey. The contribution of each individual source of income to total household income is expected to be different in Athens than in the rest of the country. It is obvious that in the Greater Athens area incomes from certain sources, such as wages and salaries, would represent a higher portion of household income than in the rest of the country. Similarly, income from agricultural activities is expected to represent a higher portion of household income in the rest of the country than in Athens. Indeed, the results of Karageorgas et al (1988) showed that the share of wages and salaries in total household income in Greece was 49%, followed by entrepreneurial income with 21.3%, and pensions with 20.6%. These estimates are similar to those for the Greater Athens area based on the 1988 survey (Balourdos et al 1990). According to these estimates, wages and salaries represented 51% of the total gross household income, followed by entrepreneurial income (20%), and pensions (18.3%).

5.3 Equivalent Versus Total and Per Capita Income

Before conducting the analysis, it was considered necessary to test the sensitivity of the results to the measure of income used in assessing inequality in Greece. The idea was to investigate how and to what degree the alternative weights, which are used in order to make households of different size and composition comparable, could affect

our results. It is known that differences in results could prove crucial as far as policy implications are concerned. Thus we decided to test three representative and widely used scales.

1. Total household income. This in an extreme case, in which there is no use of any equivalence factor in comparing households of different size and composition. It is assumed that, given the income of the household, the standard of living is the same for the all members, regardless of the size and the composition of the household. Therefore, we could consider total household income as a scale, in which the first person of the household has a weight of 1 and each additional member has zero weight.
2. Per capita household income. This is another extreme case, in which the total household income is divided by the number of members of the household. It is assumed, therefore, that all the members have the same needs regardless of age, sex or other characteristics, and it is also assumed that there are no economies of scale.
3. Equivalent household income. One equivalence scale, known also as OECD scale, was used. According to this scale, the first adult of the household has a weight of 1, while each additional adult has a weight of 0.7, and each child a weight of 0.5. This scale, as also noted by other researchers, could be seen as more plausible, since it stands between the previous two and weights adults and children differently.

In Table 5.1 some summary measures and statistics on total, per capita, and equivalent household income before and after taxes and social security contribution are

presented. In particular the Gini index (G), the Theil's Entropy index (T), the Mean Logarithmic Deviation (L), and the Atkinson indices $A_{(\varepsilon=0.5)}$ and $A_{(\varepsilon=2)}$ were used. As already noted in Chapter 4, the use of a number of different aggregate inequality indices and summary statistics was considered necessary, mainly because of the different properties and sensitivity that each individual index has in capturing particular aspects of inequality (see Cowell 1995, Sen 1997, Lambert 1993, Jenkins 1991a, Atkinson 1983, Anand 1983) (see also Chapter 7).

Table 5.1: Aggregate inequality indices (Gini (G), Theil's (T), Mean Logarithmic Deviation (L), and Atkinson $A_{(\varepsilon=0.5)}$ and $A_{(\varepsilon=2)}$) for total (non-equivalent), per capita, and equivalent household income before and after taxes and social security contributions.

INEQUALITY INDICES	TOTAL GROSS INCOME	TOTAL DISPOSABLE INCOME	PER CAPITA GROSS INCOME	PER CAPITA DISPOSABLE INCOME	EQUIVALENT GROSS INCOME	EQUIVALENT DISPOSABLE INCOME
Gini (G)	0.39991	0.39535	0.39623	0.39097	0.38336	0.37712
Mean Log. Dev. (L)	0.30157	0.29208	0.28215	0.27556	0.26747	0.25890
Theil (T)	0.30834	0.31148	0.29929	0.29963	0.28457	0.28549
Atkinson $A_{(\varepsilon=0.5)}$	0.13821	0.13641	0.13304	0.13103	0.12624	0.12406
Atkinson $A_{(\varepsilon=2)}$	0.49506	0.47673	0.45789	0.44688	0.44469	0.43108

As can be seen in Table 5.1, there are no considerable differences among the different scales we used as far as the extent of inequality in Greece is concerned. Despite the progressiveness imposed by the Greek legislation, taxes and social security contributions fail to have a significant redistributive impact on households' income.[4] The relevant aggregate inequality indices show that equivalent income (OECD scale) is slightly more equally distributed than the other two. This can also be observed by drawing the relevant Lorenz curves (Figure 5.2). Total household income is more unequally distributed than per capita income for the three-fifths of the lower income households, and is becoming more equally distributed than the per capita in the two-fifths of the richest households. The Lorenz curve for equivalent disposable income is closer to the diagonal than the relevant curves of total and per capita income.[5] This indicates that equivalent income is the one that is the most equally distributed among the three.

Of course, these results could raise a question about the need to adopt different equivalence factors in measuring inequality. In Table 5.2 the households of the sample were ranked in deciles according to total, per capita, and equivalent household income before taxes and social security contributions. Then, the households were cross-tabulated according to per capita income deciles and total household income deciles (Table 5.2a), and equivalent income deciles and total income deciles (Table 5.2b). As it can be easily observed, although the different weighting factors do not have any significant effect on the aggregate indices, they do affect greatly the rank

[4] These results are also discussed in section 5.3 and analysed in more detail in Chapter 6.

[5] We could accept that the distribution of equivalent income "Lorenz-dominates" (Lambert 1993, Jenkins 1991a, Anand 1983) the distributions of total and per capita income.

order of each particular household in the distribution. If the rank order of the households had remained unaffected, the majority of households would have appeared in the cells of the diagonal line of the Tables 5.2a and 5.2b. On the contrary, especially between the 3rd and 8th deciles, only a small fraction of the households appeared in the same deciles according to the different equivalence scales. Overall, only 30% of the households in Table 5.2a and 26,8% of those in Table 5.2b appeared to be at the same decile according to the different equivalence scales.

Figure 5.2: Lorenz curves for equivalent, per capita, and total gross household income after taxes and social security contributions.

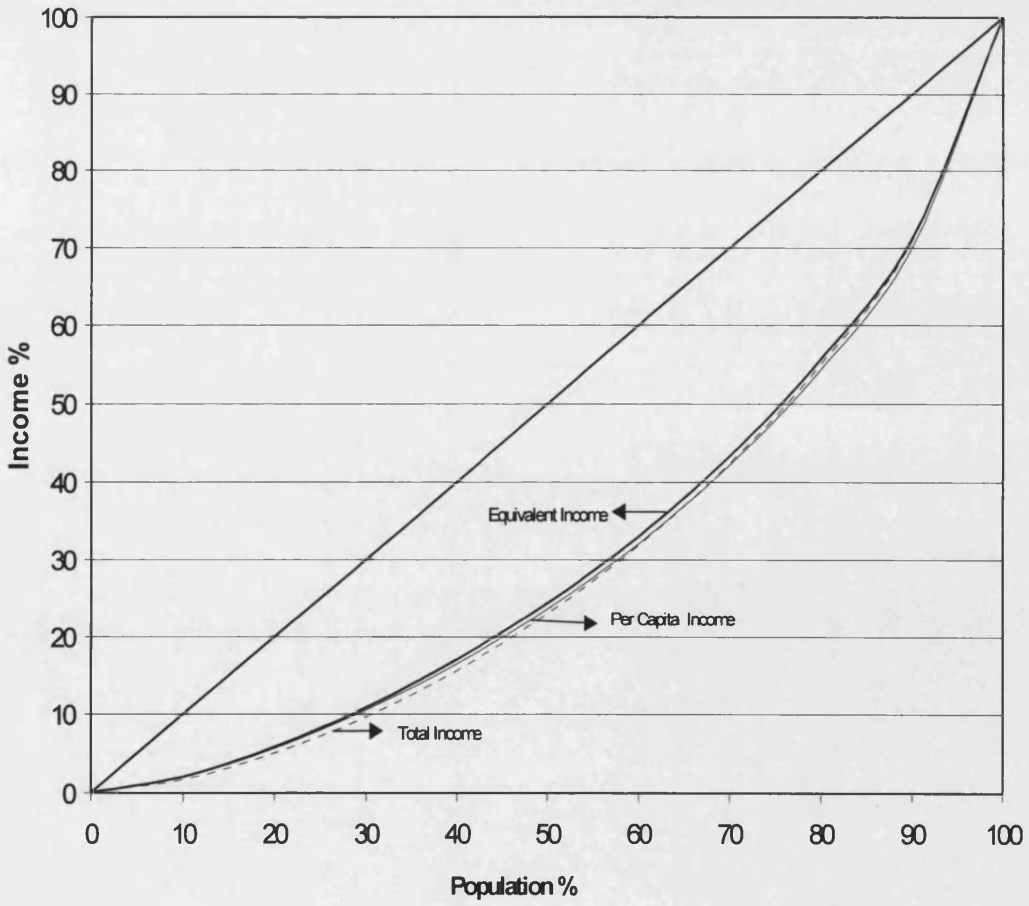


Table 5.2: Cross-tabulation of households according to total and per capita income deciles and total and equivalent income deciles.

5.2a

Total Income Deciles	Per Capita Income Deciles									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	*205*	*59*	*26*	*4*	*0*	*0*	*0*	*0*	*0*	*0*
2	*52*	*98*	*60*	*27*	*36*	*21*	*0*	*0*	*0*	*0*
3	*30*	*75*	*62*	*60*	*10*	*12*	*40*	*5*	*0*	*0*
4	*6*	*38*	*64*	*43*	*66*	*49*	*2*	*21*	*5*	*0*
5	*1*	*18*	*48*	*77*	*34*	*36*	*44*	*0*	*35*	*1*
6	*0*	*5*	*18*	*51*	*64*	*49*	*33*	*43*	*2*	*29*
7	*0*	*1*	*14*	*25*	*54*	*72*	*56*	*29*	*34*	*9*
8	*0*	*0*	*2*	*6*	*22*	*36*	*75*	*74*	*60*	*19*
9	*0*	*0*	*0*	*1*	*6*	*18*	*37*	*95*	*81*	*56*
10	*0*	*0*	*0*	*0*	*2*	*1*	*7*	*27*	*77*	*180*

5.2b

Total Income Deciles	Equivalent Income Deciles									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1	*181*	*56*	*26*	*20*	*11*	*0*	*0*	*0*	*0*	*0*
2	*59*	*65*	*74*	*13*	*7*	*36*	*40*	*0*	*0*	*0*
3	*42*	*68*	*25*	*60*	*45*	*0*	*0*	*38*	*16*	*0*
4	*9*	*51*	*49*	*44*	*28*	*73*	*14*	*0*	*25*	*1*
5	*3*	*37*	*68*	*30*	*54*	*0*	*57*	*9*	*0*	*36*
6	*0*	*10*	*32*	*75*	*18*	*62*	*0*	*68*	*0*	*29*
7	*0*	*7*	*15*	*31*	*87*	*24*	*65*	*4*	*52*	*9*
8	*0*	*0*	*5*	*16*	*25*	*69*	*38*	*70*	*46*	*25*
9	*0*	*0*	*0*	*5*	*16*	*26*	*59*	*62*	*77*	*49*
10	*0*	*0*	*0*	*0*	*3*	*4*	*21*	*43*	*78*	*145*

Therefore, as a number of particular summary measures and aggregate indices have shown, the choice of scale - even though it might not have any substantial influence on the observed inequality - does affect greatly the position of each individual household in the distribution. Having found similar results, O'Higgins et al (1990) commented that *"...this indicates that the argument for using equivalence scales is not just that their use tells one more about the true dimension of economic inequality, but that it provides a more accurate picture of the composition and characteristics of various parts of the income distribution"* (p. 47). Similarly, Sawyer (1976), justifying the use of per capita income in his study, stressed that the use of the per capita income, instead of the total household income, does not affect significantly the decile shares, but *"...it does have a substantial impact on the identity of the people in the various deciles"* (p. 18). Cowell and Mercader-Prats (1997) also argued, that the *"...distributional ranking can be very sensitive to the choice of equivalence-scale parameters that reflect sensitivity to the size and composition of household"* (p. 30). The significant policy implications of these differences on the rank of households according to different equivalence factors are apparent. Not only the design, but also the evaluation of policies such as direct taxation and social security could be affected significantly from the outcome of these measurements. In other words, the adoption of one particular equivalence scale will affect the outcome of any attempt to define "who pays and who benefits", and of course it will greatly affect the efforts, as well as the means to implement what each particular society has decided concerning "who has to pay and who has to benefit".

For the needs of this study, the use of OECD equivalence scale, as defined above, was found to be more reasonable. The reason for adopting this particular scale was not because it is considered to be the most appropriate. It is impossible to define an objectively ideal equivalence scale, since the number of assumptions and subjective evaluations on which the weights of its scale are based violate its objectivity. As pointed out by Cowell and Mercader-Prats (1997), in practice equivalence scales *"...are identified by making assumptions that are not ethically neutral, and that may be criticised as arbitrary and controversial"* (p. 8).[6] Therefore, this particular scale was chosen because it stands between the two extremes, that of the total and that of the per capita household income. In addition, it provides different weights for (any additional) children and adults, and it also imposes economies of scales in consumption within the household. Finally, it is one of the scales that has been frequently used in distributional statistics in a variety of studies, and particularly in European countries. Therefore, the use of this scale could also increase the potential comparability of the results of this study with that of similar studies in other countries.

5.4 Distribution of Equivalent Household Income by Source and Income Decile

Analysis in section 5.2 provided some general figures on the synthesis of aggregate household income. In this section, we investigate in a more detailed fashion the distribution of various elements of household income, and we examine how and to what extent the structure of household income is altered among household groups

[6] Cowell and Mercader-Prats (1997) also argued that *"...it is fanciful to suppose that equivalence scales can be constructed without the introduction of fundamental value judgements"* (p. 30).

with different total gross income. Table 5.5 summarises the distribution of equivalent household income by main income sources and deciles.[7] In this analysis, the equivalent income is used in order to account for differences in household size and composition in the rank of order.[8] The decomposition of households by income deciles shows that these household groups, apart from the differences in average total gross and disposable income, also have differences in the compositions of household income, as far as the average contribution of each individual source of income to total household income is concerned (Table 5.3.a, b, c). Therefore, we can accept that the classification of households by deciles somehow also mirrors differences in certain economic and social characteristics of each household group.

Considering the gross household income in the two extremes of the distribution, we can see that the average income of the poorest tenth of the population is only 7% of the richest tenth and 21% of the relevant figure for all households. On the other end of the distribution, the average gross income of the richest 10% of the population is almost three times higher than the figure for all households, and almost double the figure for the 9th decile. Overall, as shown in Table 5.3c, 28.7% of total household income is attributed to the richest tenth of the population and only 2% to the poorest tenth. These differences become even sharper if we consider only the wages and salaries and the entrepreneurial income (primary income). The income from these sources is more than 40 times higher in the richest tenth than in the poorest tenth of the households. The proportional distribution of disposable household income is quite similar to that of gross income so that the same comments could be made. Taxes and

[7] The deciles are composed by ranking households according to the equivalent total gross household income.

[8] Relevant estimates on the distribution of per-capita and total (non equivalent) household income

social security appeared not to have any significant distributional impact. In general, the average percentages of gross income that goes for taxes and social security contribution is lower for the 40% of poorest households than for the rest 60% of the richest. The distributional impact of taxes and social security contributions will be investigated in more detail in Chapter 6.

The contribution that each individual source has on total household income varies considerably among income deciles. As can be seen in the Table 5.4b, the average share of wages and salaries increases gradually as we move from low to high income deciles, with the exception of the richest tenth of the population where the relevant figure is quite low. By contrast, the average shares of rural and social security income show a clear decline as total household income increases. Again, the only exception concerned the richest tenth of the households, where the share is similar to the relevant figure of the 7^{th} decile. There is no such clear trend concerning the contribution of incomes from entrepreneurial activities and property to total household income. Despite that, the share of entrepreneurial income is quite low in the poorest tenth, and considerably high in the richest tenth of the households. Similarly, the average share of property income takes its highest value in the richest fifth of the households.

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by income source and deciles are presented in Appendices I and II.

Table 5.3: Distribution of equivalent disposable and gross household income from various sources and taxes and social security contributions by income deciles.

DECILES	SOURCES OF INCOME								Average Total Income	Taxes & Soc. Secur. Contrib.	Average Dispo-sable Income
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources			
					Pensions	Other Trans.	Total				
a. Means (in .000 drachmas per year).											
1	*22*	*12*	*3*	*45*	*57*	*3*	*60*	*5*	***148***	6	142
2	*60*	*32*	*6*	*68*	*81*	*4*	*85*	*26*	***276***	12	264
3	*114*	*47*	*10*	*56*	*115*	*3*	*118*	*24*	***369***	23	346
4	*154*	*69*	*11*	*82*	*112*	*2*	*114*	*28*	***458***	34	423
5	*203*	*62*	*17*	*83*	*139*	*2*	*141*	*33*	***539***	46	493
6	*262*	*95*	*12*	*66*	*146*	*2*	*148*	*51*	***634***	63	571
7	*311*	*111*	*29*	*75*	*175*	*3*	*178*	*52*	***755***	75	681
8	*430*	*162*	*24*	*86*	*165*	*2*	*167*	*42*	***911***	104	807
9	*630*	*144*	*70*	*84*	*180*	*4*	*184*	*32*	***1144***	150	993
10	*624*	*808*	*128*	*230*	*259*	*2*	*262*	*56*	***2107***	224	1883
TOTAL	**281**	**154**	**31**	**87**	**143**	**3**	**146**	**35**	**734**	**74**	**660**
b. Means as percentage of total gross household income in each row.											
1	*15.0*	*8.2*	*2.2*	*30.5*	*38.8*	*2.0*	*40.8*	*3.4*	***100.0***	4.1	95.9
2	*21.6*	*11.6*	*2.0*	*24.8*	*29.4*	*1.3*	*30.8*	*9.3*	***100.0***	4.4	95.6
3	*31.0*	*12.8*	*2.7*	*15.1*	*31.2*	*0.7*	*31.9*	*6.5*	***100.0***	6.3	93.7
4	*33.6*	*15.2*	*2.3*	*17.9*	*24.5*	*0.4*	*24.9*	*6.1*	***100.0***	7.5	92.5
5	*37.7*	*11.6*	*3.1*	*15.4*	*25.8*	*0.4*	*26.2*	*6.1*	***100.0***	8.5	91.5
6	*41.4*	*14.9*	*1.9*	*10.4*	*23.0*	*0.3*	*23.4*	*8.0*	***100.0***	9.9	90.1
7	*41.2*	*14.7*	*3.8*	*10.0*	*23.2*	*0.4*	*23.5*	*6.9*	***100.0***	9.9	90.1
8	*47.2*	*17.7*	*2.6*	*9.4*	*18.1*	*0.2*	*18.4*	*4.6*	***100.0***	11.5	88.5
9	*55.1*	*12.6*	*6.1*	*7.3*	*15.8*	*0.3*	*16.1*	*2.8*	***100.0***	13.1	86.9
10	*29.6*	*38.4*	*6.1*	*10.9*	*12.3*	*0.1*	*12.4*	*2.7*	***100.0***	10.6	89.4
TOTAL	**38.3**	**21.0**	**4.2**	**11.9**	**19.5**	**0.4**	**19.8**	**4.7**	**100.0**	**10.0**	**90.0**
c. Means as percentage of relevant total household income from each source.											
1	*0.8*	*0.8*	*1.0*	*5.2*	*4.0*	*11.1*	*4.1*	*1.4*	***2.0***	0.8	2.1
2	*2.1*	*2.1*	*1.8*	*7.8*	*5.7*	*14.0*	*5.8*	*7.4*	***3.8***	1.6	4.0
3	*4.1*	*3.1*	*3.2*	*6.4*	*8.0*	*10.0*	*8.1*	*6.9*	***5.0***	3.2	5.2
4	*5.5*	*4.5*	*3.4*	*9.3*	*7.8*	*7.1*	*7.8*	*8.1*	***6.2***	4.6	6.4
5	*7.2*	*4.0*	*5.4*	*9.5*	*9.7*	*8.1*	*9.7*	*9.4*	***7.3***	6.2	7.5
6	*9.3*	*6.1*	*3.9*	*7.5*	*10.2*	*8.0*	*10.2*	*14.5*	***8.6***	8.5	8.6
7	*11.1*	*7.2*	*9.3*	*8.6*	*12.2*	*10.3*	*12.2*	*14.9*	***10.3***	10.1	10.3
8	*15.3*	*10.5*	*7.8*	*9.8*	*11.5*	*8.6*	*11.5*	*12.1*	***12.4***	14.2	12.2
9	*22.4*	*9.3*	*22.6*	*9.6*	*12.6*	*14.5*	*12.6*	*9.2*	***15.6***	20.4	15.0
10	*22.2*	*52.4*	*41.5*	*26.3*	*18.1*	*8.2*	*18.0*	*16.1*	***28.7***	30.3	28.5
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Note: Deciles ranked by total gross household income

Based on the above information, we can also point out certain similarities and differences between deciles, as far as the average size and composition of household income is concerned. As Table 5.4b shows, the main income sources for the one fifth of the lower income population derives from social security (pensions) and rural activities. The average shares for this group is considerably higher that the relevant figures for all households. These are also the only deciles in which the average share of income from rural activities is significantly higher than the income from wages and salaries. The shares of wages and salaries, entrepreneurial income and property incomes are considerably lower than the relevant total average shares for all households.

Deciles 3, 4 and 5 also have a number of similarities. The total income of these household groups are still below the total mean, while the income from wages and salaries is now the most important income source.[9] Of course, the share of wages and salaries in total income remains below the average figure for all households, which is 38.3%. Social security is the second most important income source. Finally, the rural income is still significantly attributed to total household income. Both the income from social security and rural income, as proportions of total household income, are higher than the relevant average figures for all households.

Deciles 6 and 7 have an almost identical average proportional distribution of household income to its main sources. In both deciles the share of wages and salaries is by far the most important income source. This share is now higher than the relevant average figure for all households. Similarly, the percentage of income from social

[9] The only exception concerns the share of wages and salaries in the 3rd decile, which appeared almost equal with that of income from social security.

security is still higher that the relevant average total and thus it becomes the second important source of household income. A significant proportion of the household income is also attributed to entrepreneurial activities. This figure still remains below the relevant average total for all households. In this group, the income from wages and salaries and entrepreneurial activities represents more than 50% of the total household income.

The deciles 8 and 9 have wages and salaries as the main income source. Although the average share of salaries and wages is higher for the households on the 9th decile, the percentage of entrepreneurial income appears higher in the 8th decile. Overall, in these groups, more than 64% of the household income is attributed to wages and salaries and entrepreneurial activities. Of course, the share of wages and salaries remains above the relevant average figure for all household groups. By contrast, the average share of entrepreneurial income is still below the relevant figure for all households. As we move from low to high income deciles, these are the first deciles in which the income from social security - as a proportion of total household income - becomes lower than the relevant figure for all households.

Finally, the richest tenth of the households appears to have some unique characteristics. First, it is the only decile in which the average total household income is almost double of that of the previous decile. Another unique characteristic of this group is that the entrepreneurial income appears to be the most significant source of household income. It is the only decile in which the average share of this source is considerably higher (38.4%) than the relevant figures in other deciles. More than 52% of total entrepreneurial income is attributed to these households. Additionally, as

already shown, it is only in this group that the share of wages and salaries does not follow the increasing pattern as one moves from poorer to richer deciles. In fact, the share of this source in total household income is even lower than that of the 3rd decile. Finally, the average contribution of property income is well above the similar figure for all households. By contrast, the shares of social security and rural income are below the relevant figure for all households.

5.5 Decomposing Inequality by Income Source

The decomposition analysis of inequality by income source seems rather more complicated than the one by population subgroup. Although Shorrocks (1982, 1983) has suggested that, potentially, there are a large number of inequality indices that could be used for this type of decomposition analysis, in practice only a limited number appears to be really satisfactory and convenient (Shorrocks 1982, Cowell 1995). The most significant problem in the decomposition of inequality by income source is the fact that quite often the income of one unit is attributed to more than one source. In other words, the sources of income are overlapping. In addition, there is a need to take into account and estimate the non-negative, as well as the negative contribution that a particular source of income might have to total inequality. Similarly, it is of great importance to estimate contributions to total inequality of particular sources, like the one of taxes and social security contributions, that should be considered as negative incomes.

In this study, the square of the coefficient of variation was chosen since it seems to satisfy all the decomposability properties, and seems to have a more straightforward interpretation (Cowell 1995, Jenkins 1995).

$$C^2 = \frac{1}{\mu^2 n}\sum_{i=1}^{n}[Y_i - \mu]^2 = \frac{\sigma^2}{\mu^2}$$

where C^2 is the squared coefficient of variation, Y_i the income of the unit (household) i, μ the mean income and σ^2 the variance.

The initial question in this decomposition exercise is how to settle the rule that will enable us to define the total inequality as the sum of the contributions of each source of income.[10]

$$S = \sum S_k$$

where S is the total inequality and S_k is the "absolute contribution" of the source K to total inequality. Therefore, the proportional contribution of each source to total inequality can be expressed as:

$$s_k = \frac{S_k}{S}, \quad \text{while } \sum s_k = 1.$$

[10] The method for decomposing inequality by the sources of income, which is presented here, is mainly based on Shorrocks (1982, 1983).

where s_k is the "proportional contribution" of factor K to total inequality.

Any function that creates appropriate values for the proportional contribution could be considered as a rule for decomposition. According to Shorrocks (1982, 1983), there is an unlimited number of decomposition rules that can be applied to each inequality index. These rules are also independent of the inequality index that we chose. Despite this, based on theoretical and empirical evidence, Shorrocks (1983) has argued in favour of a unique function, the "natural decomposition rule of the variance", which seems to perform in a rather satisfactory way for understanding the relative contribution of each source of income to total inequality. This decomposition rule has already been used in a number of relevant studies in the field (Adams 1994, Adams and He 1995, Jenkins 1995).

Following Shorrocks (1982), we can first examine how the variance for total income could be decomposed according to the sources of income. Knowing that the incomes from different sources are correlated (between them), we can express the variance of total income in the following way:

$$\sigma^2 = \sum \sigma_k^2 + 2\sum_{j<k} \mathrm{cov}\left(Y_j, Y_k\right)$$

where σ^2 is the variance of total income, σ_k^2 is the variance of incomes from the source K and $\mathrm{cov}\left(Y_j, Y_k\right)$ is the covariance between the household incomes from J and K source. According to Shorrocks, (1982), the "natural decomposition" of the variance assigns to this source half of all the interaction terms in which the incomes

from the source K are involved. Therefore, the absolute contribution of each source to total inequality becomes:

$$S_k^{\sigma} = \text{cov}(Y_k, Y)$$

where S_k^{σ} is the absolute contribution of factor K in the value of the variance for total income and Y is the total household income. The absolute contribution of each source to total inequality is equal to the covariance between the income of this source and the total household income. The variance for the total income becomes:

$$\sigma^2 = \sum \text{cov}(Y_k, Y) = \sum S_k^{\sigma}$$

The proportional contribution of factor K to total variance is now

$$s_k = \frac{S_k^{\sigma}}{\sigma^2} = \frac{\text{cov}(Y_k, Y)}{\sigma^2}$$

Since,

$$\text{cov}(Y_k, Y) = \rho_k \sigma_k \sigma$$

the proportional contribution of each sources could also be expressed as

$$s_k = \frac{\rho_k \sigma_k}{\sigma}$$

where ρ_k is the correlation coefficient between Y_k and Y, σ_k is the standard deviation for the incomes from source K, and σ is the standard deviation for total income. This is the natural decomposition rule for the variance. Variance is rather problematic as an inequality measure, since it does not satisfy the mean independence axiom (Cowell 1995, Sen 1997a). Therefore, as already noted, in this analysis of decomposition the square of the coefficient of variation is used. It is easy to prove that the above rule is also the natural decomposition rule for the square of the coefficient of variation.[11] Using the squared coefficient of variation, the absolute contribution S_k^c of income from the source K to total inequality becomes

$$S_k^c = \frac{\text{cov}(Y_k, Y)}{\mu^2}$$

while the proportional contribution s_k of incomes from source K to total inequality is now:

$$s_k = \frac{\text{cov}(Y_k, Y)}{\sigma^2} = \frac{\rho_k \sigma_k}{\sigma}$$

Although this analysis could provide us with estimates concerning the proportional, as well as the absolute contribution of each source of income to overall inequality, it would be more illuminating to have some further information on the issue. From a policy perspective, it would be of particular importance to know the influence that a

[11] See Shorrocks (1982).

decrease of inequality in the distribution of income in one source would have on overall inequality. Similarly, it would be equally significant to compare that estimate with the alternatives; that is with the expected impact on overall inequality that a decrease of inequality of income of another individual source or of the rest of the sources would have. Shorrocks (1982) proved that, indeed, the contribution that each source of income has to total income inequality is attributable to two factors: first, to the inequality that would exist if source K were the only source of income inequality while the income of the rest of the sources were to be equally distributed; and second, to the reduction of overall inequality that would be caused if inequality in income from source K were eliminated while the distribution of income for the rest of the sources remained unchanged. He also showed that for the square of the coefficient of variation the contributions of each source can be expressed as follows:

$$S_k^c = \frac{(C_k^a + C_k^b)}{2}$$

where:

$$C_k^a = \frac{\sigma_k^2}{\mu^2} \quad \text{and} \quad C_k^b = \frac{\sigma_k + 2\,\mathrm{cov}(Y_k, Y - Y_k)}{\mu^2}$$

Following Jenkins (1995), in this study we will also provide the following estimates

$$\alpha_k = \frac{C_k^a}{C^2} \quad \text{and} \quad \beta_k = \frac{C^2 - C_k^b}{C^2}$$

where α_k is the proportion of inequality that would remain if the distribution of income from source K remained unchanged while the incomes for the rest of the sources became equally distributed; and β_k is the proportion of inequality that would remain if the income from source K became equally distributed while the distribution of income for the rest of the sources remained unchanged. In the analysis that follows, we will refer to these impacts as effects α and β respectively.

5.6 The Decomposition of Inequality by Income Source: Main Findings

Table 5.4 presents estimates for the decomposition of inequality of equivalent household income before taxes and social security contribution according to the main sources of income. As can be seen, although the income from entrepreneurial activities represents only 21% of the aggregate total equivalent household income, it appears to be by far the most significant source of inequality: 65.8% of the overall inequality is attributed to income from entrepreneurial activities. By contrast, wages and salaries, despite them being the main source of household income, contribute to the overall inequality by only 16.3%, followed by rural income with 9.5%. Incomes from property, social security and other sources appear to have a relatively small proportional contribution to the overall inequality.

Table 5.4: Decomposition of inequality of equivalent household income before taxes and social security contributions, by sources of income.

	SOURCES OF INCOME						AVERAGE GROSS INCOME
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security	Other Sources	
$(\mu_k/\mu)*100$	38.3	21.0	4.2	11.9	19.8	4.7	100.0
ρ_k	0.299	0.762	0.238	0.236	0.105	0.038	1.000
C_k^2	2.186	18.362	16.935	12.449	3.519	4.345	1.086
S_k	0.177	0.715	0.043	0.103	0.041	0.007	1.086
s_k*100	16.3	65.8	3.9	9.5	3.8	0.7	100.0
α_k*100	29.5	74.7	2.7	16.3	12.8	3.0	100.0
β_k*100	97.0	43.0	94.8	97.2	105.2	101.7	0.0

$(\mu_k/\mu)*100$: the share (in percentages) of income from source K in total gross household income,

ρ_k : the correlation coefficient between the income from source K and the total gross household income (all the values are statistical significant at 0.01 level),

C_k^2 : the squared coefficient of variation,

S_k : the absolute contribution of source K to total inequality,

s_k*100 : the proportional contribution (in percentages) of source K to total inequality,

α_k*100 : the percentage of total inequality that would remain if the distribution of income, from source K remained unchanged, while the incomes for the rest of the sources became equally distributed,

β_k*100 : the percentage of the total inequality that would remain if the inequality of income from source K were eliminated, while the distribution of income for the rest of sources remained unchanged.

Examining the impact on inequality that each individual source of income has under the effects α and β, the importance of entrepreneurial income is also signified. By equalising the distribution of all other sources of income, with the exception of the income from entrepreneurial activities, the inequality would remain at 74.7% of its

current level. In other words, the total inequality would be reduced by only 25%. On the other hand, if the income from entrepreneurial activities became equally distributed while the distribution of income from the rest of the sources remained unchanged, overall inequality would be reduced to 43% of its actual figure. Therefore, by eliminating only the inequality in the distribution of the entrepreneurial income, overall inequality would be reduced by 57%.

By investigating the influence of wages and salaries to overall inequality under the effects α and β, it was found that, despite being by far the most significant source of household income, they have a much less significant impact than entrepreneurial income has. Indeed, if wages and salaries became the only source of inequality while the incomes from the rest of the sources became equally distributed, inequality would be reduced to 29.5% of its current level. If, by contrast, the only source of income that became equally distributed were wages and salaries - which represent 38.3% of total gross equivalent household income - the overall inequality would remain at 97% of its actual figure. In other words, by eliminating the inequality of the distribution of wages and salaries but leaving the distribution of income of the rest of the sources unchanged, overall inequality would be reduced by only 3%.

An important comment should be made about the influence that the property income appears to have on the overall inequality. It is obvious, and has already been reported in the relevant literature, that property income is usually significantly underestimated in distributional statistics. Therefore, according to our data, the income from this source appears to represent only 4.2% of the total equivalent household income in Greece. Despite that, and despite also the fact that property income appears to be a

rather small contributor to total inequality, elimination of the inequality of the distribution of income from this source alone would reduce the overall inequality more than if we had eliminated the inequality in wages and salaries. On the contrary, as expected, if the income from social security were the only source that became equally distributed, the overall inequality would be increased by 5.2%. If, therefore, the income from social security, which appears to contribute by 3.8% to overall inequality, became equally distributed while the distribution of income from the other sources remained unchanged, it would result in an increase of overall inequality, though not a large one.

The income attributed to the category "other sources" appears to have a similar impact to that of social security income. By eliminating only the inequality of the distribution of income from this source overall inequality would increase, though marginally. That is because the income from this source is mainly attributed to alimony for former spouse and children and to other remittances. As Papatheodorou (1992) has shown, the proportional contribution of income from this source to total household income appears to be more significant for the low and middle-income population than among the rich.[12]

Concerning the influence of each individual source of income to overall inequality, the above figures change considerably when the inequality in question is that of

[12] Papatheodorou (1992) shows that, if no equivalence scale is used, income from "other sources" appears to represent more than 13.5% of the total household income among 20% of the households with lower income. By contrast, the proportional contribution of this source to overall income is below 4% for 40% of the richer households (Table 3.4, page 67). If the equivalent income (OECD scale) is used instead, this impact becomes less clear. However, it still appears that the proportional contribution which the income from this source has on the total household income is more significant among the low and middle income range households than among the rich (Papatheodorou 1992, Table 3.7, page 79).

disposable household income. This is the household income after taxes and social security contributions. Disposable household income can be expressed as the sum of incomes of all the sources of gross household income minus the taxes and social security contributions. Therefore, taxes and social security contributions are treated here as a negative income. Table 5.5 presents estimates of the decomposition of the inequality of the disposable household income by sources of income and taxes and social security contributions.

As it can be seen in Table 5.5, the impact of income from entrepreneurial activities as a contributor to overall inequality has been increased. Thus 72.2% of the inequality of the total net household income is now attributed to the incomes from this source, while the relevant figure for gross income, as far as the contribution of this source to overall inequality is concerned was 65%. By contrast, the proportional contribution of wages and salaries to overall inequality has now been reduced to 12%. It thus appears lower than the comparable figure concerning its contribution to inequality of gross income. The proportional contributions that the rest of the sources have to the overall inequality of disposable income appear to be higher, though marginally, than the corresponding figures concerning gross income. It, therefore, seems that the negative contribution that taxes and social security contribution have to the overall inequality of disposable income is mainly associated with the reduction of the contribution of wages and salaries.

Table 5.5: Decomposition of inequality of disposable (equivalent) household income according to sources of (gross) income and taxes and social security contributions.

	SOURCES OF INCOME						TAXES & SOCIAL SECURITY CONTRIB.	AVERAGE DISPOSABLE INCOME
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security	Other Sources		
$(\mu_k/\mu)*100$	42.6	23.4	4.7	13.2	22.1	5.3	-11.2	100.0
ρ_k	0.207	0.786	0.235	0.273	0.109	0.049	-0.300	1.000
C_k^2	2.186	18.362	16.935	12.449	3.519	14.345	2.768	1.186
S_k	0.142	0.857	0.049	0.139	0.049	0.011	-0.061	1.186
s_k*100	12.0	72.2	4.1	11.7	4.1	0.9	-5.1	100.0
α_k*100	33.4	84.5	3.1	18.4	14.4	3.4	2.9	100.0
β_k*100	109.4	40.0	94.8	95.0	106.1	101.6	113.1	0.0

$(\mu_k/\mu)*100$: the share (in percentages) of income from source K in total disposable household income,

ρ_k : the correlation coefficient between the income from source K and the total disposable household income (all the values are statistical significant at 0.01 level),

C_k^2 : the squared coefficient of variation,

S_k : the absolute contribution of source K to total inequality,

s_k*100 : the proportional contribution (in percentages) of source K to total inequality,

α_k*100 : the percentage of total inequality that would remain if the distribution of income from source K remained unchanged, while the incomes for the rest of the sources became equally distributed,

β_k*100 : the percentage of total inequality that would remain if the inequality of income from source K were eliminated, while the distribution of income for the rest of sources remained unchanged.

The impact that the different sources of income, as well as taxes and social security contributions have on the overall inequality of disposable income could be elucidated more, if examined also under the α and β effects. It is found that if the distribution

of entrepreneurial income became the only source of inequality, the overall inequality of the disposable household income would be 84.5% of its actual level. On the contrary, by eliminating the inequality in the distribution of entrepreneurial income while leaving the distribution of income of the rest of the sources unchanged, the overall inequality would be reduced by 60%. It thus appears that the impact of the entrepreneurial income to overall inequality under the effects α and β, is by far the most significant one. It also signifies the increased impact that entrepreneurial income has on the overall inequality of disposable income in comparison with its relevant impact to the inequality of gross income.

One figure that changes dramatically in disposable income, compared with that of the gross income, is the influence that wages and salaries appear to have under the effects α and β. By leaving the distribution of wages and salaries unchanged while eliminating the inequality of the distribution of income for the rest of the sources, overall inequality would be reduced by almost 67%. On the contrary, if the inequality in the distribution of wages and salaries were eliminated while the income distribution of the rest of the sources remained unchanged, the overall inequality would then be increased by 9.4%. This phenomenon should be explained by looking into the association that taxes and social security contributions appear to have with wages and salaries. Indeed, as Papatheodorou (1992) has shown, the proportion of household income that goes for taxes and social security contributions appears to be associated mainly with the share of wages and salaries in total household income rather than the total income itself.[13] As already reported in a number of studies, there is substantial tax evasion in Greece, which is mainly observed in high income groups in which the

[13] See also Chapters 6 and 7 of the present study.

entrepreneurial income is a significant contributor to household total income.[14] An attempt to eliminate inequality in the distribution of wages and salaries, leaving the distribution of income from other sources unchanged, would reduce the negative impact that taxes and social contributions have and would, therefore, increase inequality. In other words, it seems that the redistributive impact of taxes and social security contributions concerns mainly the wages and salaries. Therefore, the reduction in inequality that the (unchanged) distribution of taxes and social security contributions causes is now partly compensated by the increase in inequality of disposable (after tax and contributions) income, which the equality of the distribution of wages and salaries create. The impact that the rest of the sources have under the effects α and β on the overall inequality of disposable income is more or less the same with that on gross income and, therefore, the same comments would apply.

5.7 Conclusions and Policy Implications

In this chapter, income inequality in Greece was investigated using an analysis by income source. The aim was to provide suitable additional information on the structure and the profile of income inequality in Greece. In addition, the results could also serve as a frame of reference for evaluating the potential effect that particular government policies could have on income inequality. Policy makers might be helped by these results mainly in two ways: first, by being able to decide on more effective

[14] Karageorgas and Pakos (1988) have also argued that tax evasion in upper income groups results in a reduction of the taxes that these groups are obliged to pay. Athanassiou (1984) has shown that the declared income to tax authorities was only 29.9% of the relative figure in National Accounts, while agricultural income represented only 0.28%, entrepreneurial income 3% and salaries and wages 44% respectively. Negreponti-Delivanis (1990) has also argued that there are obvious indications that tax evasion mainly concerns the self-employed.

policies for reducing inequality, and second, by improving their tools for evaluating and predicting the potential implications that other government policies or actions might have on income inequality, poverty and, consequently, social development.

Initially, the analysis showed that the alternative scales used for making households of different sizes and composition comparable may not have any significant effect on certain aggregate inequality indices. By contrast, they do affect greatly the rank order of each particular household in the distribution. The policy implications of this effect are apparent. The design, evaluation, and implementation of a number of policies such as direct taxation and social security would be affected significantly by the equivalence scale used in assessing inequality. Overall, equivalent household income (OECD scale) appeared slightly more equally distributed than per capita and total (non-equivalent) income.

The analysis by deciles showed that the proportional distribution of disposable household income is almost identical to that of before taxes and social security contributions income. Therefore, taxes and social security contributions were found to have no significant distributional impact. The contribution of each individual source to gross household income appeared to vary significantly between income deciles. The average share of wages and salaries increases gradually with total household, with the exception of the tenth of the richest population. By contrast, rural and social security income gradually reduces their average shares as total household income rises (with the only exception being the share of rural income of the richest tenth). More than 52% of total entrepreneurial income is concentrated in the households of the richest

decile. The aggregate share of entrepreneurial income did not seem to follow any clear pattern in the rest of the deciles.

The decomposition analysis of inequality by income source shows that entrepreneurial income, though it appears to represent only 21% of the total equivalent household income, makes by far the most significant contribution to overall inequality. Even if the distribution of incomes from the rest of the sources became equally distributed, by leaving the distribution of entrepreneurial income unchanged the overall inequality of disposable income would remain at 85% of its current level. Eliminating only the inequality of the distribution of entrepreneurial income the overall inequality would be reduced by 60%. By contrast, wages and salaries, despite being the most important source of income, are considerably less significant contributors to overall inequality. The change in impact that wages and salaries have on the inequality of disposable income in comparison to that of gross income provide evidence for the association that this source of income has with taxes and social security contributions. Thus the negative contribution that taxes and social security contributions have on the overall inequality is mainly attributed to the reduction of the inequality among wages and salaries.

Taxes and social security contributions appear to be a negative contributor to overall inequality, though not a large one. This weak impact on reducing inequality is mainly attributed to tax evasion in Greece and, in particular, among the incomes from entrepreneurial activities. Taxes and social security contributions seem to influence only the distribution of wages and salaries.

Comparing these findings with those of other studies, the importance of entrepreneurial income as a contributor to overall inequality in Greece is emphasised. Additionally, the weakness of the Greek system of income taxes and social security contributions in reducing inequality is also stressed. Jenkins (1995) showed that the dominant contributor to overall inequality in the UK, during the period 1971-86, was employment earnings. Similarly, his estimates show that, during the same period, the negative contribution that income taxes and national insurance contributions had to overall inequality in the UK were almost six times higher than the relevant figures for Greece.[15]

Reduction of the inequality of entrepreneurial income appears to be the most effective way to reduce total inequality in Greece. It is, therefore, of great importance to redesign the current tax system in Greece so as to become efficient enough to eliminate tax evasion among the recipients of entrepreneurial income. This policy could prove the most efficient, if not the only way, to significantly reduce income inequality. A simple increase of tax rates, under the current structure of the Greek tax system, would mainly affect the incomes from wages and salaries. Therefore, the contribution of net income from wages and salaries to total disposable household income would be reduced. In addition, depending on the progressiveness of taxes and social security contributions, it would also cause a further decrease in the inequality of net wages and salaries. This possible decrease in the inequality of wages and salaries would have only a marginal impact on the overall inequality of the disposable income.

[15] According to Jenkins' (1995) estimates, during the period 1971-86 the negative contribution of income taxes alone to overall inequality was between -25% to -34%, while the effect of the national insurance contributions was between -3% to -6%. The relevant figure in Greece, concerning the effect that both income taxes and social security contributions have on the overall inequality, were only -

The sources in which household income is decomposed in this analysis would allow a comparison with the relevant macroeconomic figures and, in particular, with those of the National Accounts. Assuming that any increase of the income of a source K would be distributed in the same way as the rest of the income from the same source, the above results could provide a frame of reference for evaluating the potential implication that a number of government policies – such as growth policies – might have on overall inequality. Thus any increase of the share that entrepreneurial income has in the total income would result in a significant increase in overall inequality. By contrast, an absolute increase of the total wages and salaries, while everything else remained unchanged, would cause a decrease in the share of entrepreneurial income in total household income, and thus would result in a reduction in overall inequality. Similarly, an increase in unemployment would not only reduce the wages and salaries, but would quite possibly increase the proportional contribution of entrepreneurial income to total income. Therefore, overall inequality would be expected to increase not only because of the growth of inequality in wages and salaries, but also because of the effect that the now increased share of entrepreneurial income would be expected to have.

Lack of available data in Greece has restricted this analysis to the use of income data of only one year. Decomposition analysis by sources of income for time-series data would allow us to investigate in more detail the effect that changes in particular macroeconomics figures have on income inequality. It would thus allow more precise predictions and evaluations of the implications that a number of government policies - particularly those which are targeted at the growth of certain macroeconomic

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5.1%.

indicators - would have on income inequality and, consequently, on poverty and social development.

CHAPTER SIX

INCOME TAXES AND SOCIAL SECURITY CONTRIBUTIONS AND THEIR DISTRIBUTIONAL IMPACT

6.1 Introduction

The analysis in the previous section provided evidence on the weak redistributive impact that income taxes and social security contributions appeared to have on household income. This chapter analyses the distributional impact of income taxes and social security contributions in more detail, and particularly in relation to different types of income. The evidence of the previous chapter contradicted the effects that the progressive income taxation imposed by the Greek legislation would be expected to have on the distribution of household income. In general, it was shown that income taxes and social security contributions failed to have any significant redistributive impact. The (proportional) distributions of gross and disposable household income appeared to be almost identical. As Hills (1988) noted, since taxation is considered as a "key weapon" in the redistribution of income, the question that emerges is whether and to what extent the income taxes and the social security contributions achieve their distributional goals.

The differences between gross and disposable income were discussed in more detail in Chapter 3, and it was argued that the use of both concepts is of particular importance in order to investigate certain aspects of inequality in Greece. It was also argued that the disposable income is the one that more closely represents the household's potential purchasing power and, therefore, its (potential) living standards. Thus the use of both income concepts is crucial for understanding and explaining the actual distribution of disposable household income, as well as for analysing the influence that government interventions have, especially through income taxes and social security contribution.

Evidence in Chapter 5, since it disputes the effects that government intervention in this area was expected to have, provides the incentive for a more detailed analysis of this issue. This analysis cannot be considered as a comprehensive investigation of all the dynamic and potential influences that government policies have, through taxes and social security contributions, on household income. This is a large task in itself. The purpose of this section is rather to explain and shed more light on some particular aspects of the issue that relates mainly to the targets of this study, by utilising the information provided by the 1988 sample survey. It also intends to provide additional information on an issue for which there is a limited amount of research, mainly due to the lack of appropriate statistical data.

6.2 Existing Studies in Greece

Indeed, studies on the impact of income taxes and/or social security contributions on personal income distribution are rather limited in Greece. As already noted, the scarcity of appropriate data and information impedes investigation of certain aspects of economic inequalities. One of these aspects is that concerning the impact that income taxes and social security contributions have on the distribution of household disposable income. It could, therefore, be argued that there is no systematic study so far on this issue.

A more detailed report in Chapter 2 pointed out that the only sources of relevant statistical data that have been broadly available and have been used by researchers in this field were the Family Expenditure Surveys (FES) and the Tax Returns (TR). Both have serious drawbacks in analysing particular aspects of inequality in Greece, and are generally considered to be rather problematic and with certain limitations for investigating the redistributive impact of direct taxes and social security contributions. FES provide reliable estimates only for the household consumption expenditure, while the household income is seriously underestimated. TR is never considered a reliable source of information for this purpose, mainly because of the low coverage of the population (until recently) and the high tax evasion in Greece.

The first significant attempt to investigate the redistributive impact of income taxes in Greece was made by Karageorgas (1973). Using consumption expenditure data from 1964 FES, he estimated household income using a logarithmic consumption function based on the National Accounts data. He found that the distribution of the tax burden

was highly regressive for the low and middle-income families and slightly progressive for the high income ones. The tax system was found to increase the overall inequality of income in Greece. Although his analysis focused on the total effect that the tax system (direct, indirect and property taxes) has on the distribution of income, he also provided estimates of the distribution of income taxes and social security contributions by income brackets. Karageorgas found that the actual income tax rates for the middle and upper income families were only one third of the rates that they should have had to pay according to the Greek tax legislation. Similar results were also reached by Karageorgas (1977) when he applied the same methodology to the 1974 FES data.[1] Finally, in a follow up study, Karageorgas and Pakos (1988) used the same methodology in analysing the data from the 1982 FES. They found that overall inequality did not appear to be affected by the tax system. In other words, the tax system did not appear as regressive as in the two previous studies (Karageorgas 1973, 1977). The authors did not comment on the effect that income taxes and social security contributions alone have on the distribution of income. Despite that, their figures allow us to comment on the issue. According to their estimates, the families in the lower income bracket pay the highest percentage of income taxes and social security contributions of all other groups of households. Generally, their evidence suggests that income taxes and social security contributions appeared to be rather regressive as far as their effect on the overall inequality is concerned.

By contrast, using Tax Return data, Germidis and Negreponti-Delivanis (1975) found that, for the period 1961 to 1971, direct taxation had a moderately negative impact on income inequality in Greece and, therefore, it seemed to achieve - to some degree - its

[1] Karageorgas (1977) did not provide estimates on inequality indices. However, Tsakloglou (1988) provided comparable estimates for Gini index based on Karageorgas findings (see also Chapter 2).

progressive character, as defined by the relevant legislation. The estimates for the Gini index, provided by the authors for 1971 were 0.363 before taxes income and 0.340 after direct tax. Loizides (1986) also used the Tax Returns data for the period 1968 to 1978. He argued that the income taxes in Greece are indeed progressive and, additionally, their rate of progression increased during that period. Similar conclusions, as far as the progressive impact of direct taxation on overall inequality is concerned, was reached by Loizides (1988) and Papapanagos (1994), who also based their analysis on Tax Returns data. Of course, the estimates provided by these studies must be treated cautiously, mainly due to the serious drawbacks which are associated with the use of Tax Returns data (see also Mitrakos and Tsakloglou 1997). A large part of the low-income population was excluded from tax returns statistics, since they were not obliged to declare their income to tax authorities. Additionally, the actual picture of the distribution of income in Greece could also be altered significantly using this source of data, due to the high tax evasion in Greece (Provopoulos 1979, Athanassiou 1984, Karageorgas et al 1990, Negreponti-Delivanis 1990, Livada 1991).[2]

The data used in the present study, as already noted in Chapter 2, is not subject to the drawbacks of the Tax Returns data to the same extent. It cannot, of course, be argued that the relevant estimates on this issue are totally unbiased, free from errors or immune to influences from tax evasion. What is argued is that this data could serve as a more appropriate basis for analysing relevant issues. The sample design that was adopted in the 1988 survey guarantees a better representation of all population groups.

[2] In Chapter 2 there is a more detailed review on these studies, as well as on the availability and limitations of relevant databases in Greece. A brief review is also provided by Tsakloglou and Mitrakos (1998).

Consequently, the low-income population is expected to be more equally represented. Additionally, respondents did not have the same motives to hide their true income as people often do when they declare it to tax authorities.

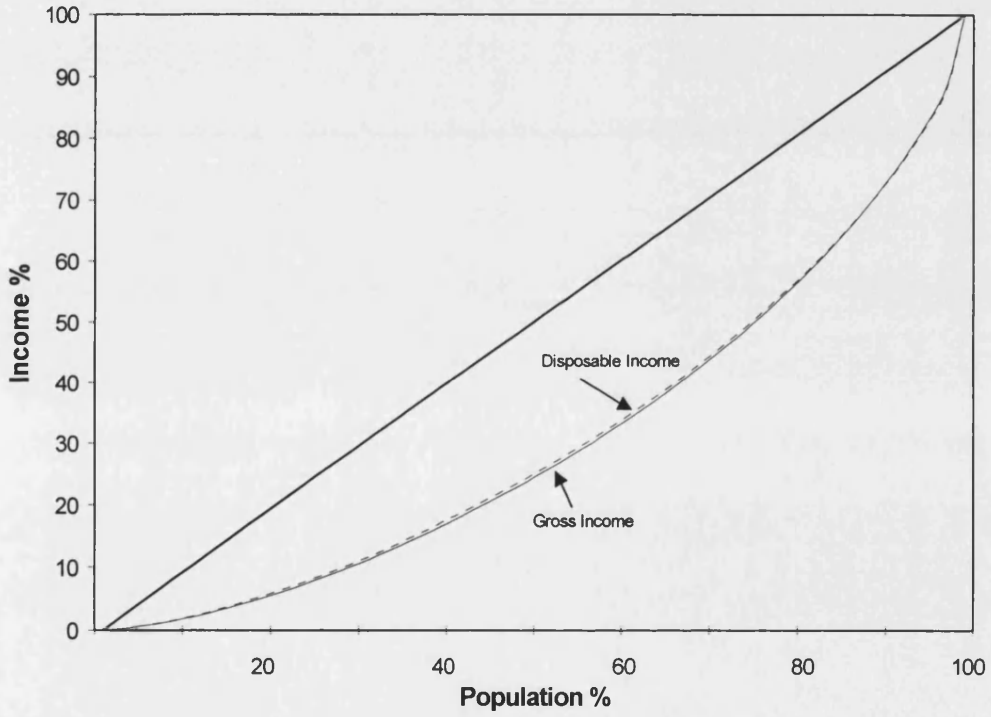
6.3 Analysis by Income Deciles

In carrying out our analysis, it is important to first examine in more detail the findings of the previous chapters that relate to this issue. Analysis in Chapter 5 showed that the distributions of gross and disposable household income do not vary significantly. Using a number of alternative indices, in order to capture the different aspects of inequality, it was found that the relevant values of each index for the gross and disposable income are almost identical (Table 5.1). More precisely, the relevant estimates of all indices used, except Theil (T), showed that disposable income appeared marginally more equally distributed than gross income.[3] These findings do not appear to be affected by the use of alternative equivalence factors in order to make the household of different sizes compatible. Drawing the Lorenz curves that correspond to gross and disposable equivalent income, we could also see that the two curves are almost identical (Figure 6.1). Disposable income is apparently slightly more equally distributed in the middle income population groups. Therefore, although we have no clear picture of what may be happening at the very ends of the distribution

[3] Theil (T) index showed that the household disposable income is marginally more unequally distributed than the before taxes and contributions income. This is probably due to the fact that Theil (T) index is more responsive than the other indices to the transfers at the top of the distribution (see also Chapter 7).

(tails), we could assume that the Lorenz curve for disposable income lies closer to the diagonal than the relevant curve for gross household income does.[4]

Figure 6.1: Lorenz curves for before and after taxes and social security contributions (equivalent) household income.



Also, the analysis of the distribution of income by income deciles provides more explicit evidence on the influence that taxes and social security contributions appear

[4] It is expected, however, as the distribution by income deciles shows, that these Lorenz curves will intersect somewhere at the top 10% of the high-income population. This could explain also the increase of inequality of disposable income showed by Theil (T) index. These differences in proportional distributions are quite small to be clearly observed in these curves.

to have on the distribution of disposable household income. As can be seen in Table 5.3.b (Chapter 5), the average taxes and social security contributions in Greece represent 10.0% of total gross household income. These results show that taxes and social security contributions, despite being progressively imposed by Greek legislation, fail to have a significant redistributive impact on household income. In general, the average proportion of household income that goes for taxes and social security contributions appeared to be lower among the households of the four lower deciles than among those of the six richer deciles. These differences are not considered important enough to have a significant redistributive impact on household income. Similarly, although in the four lowest income deciles the percentages of taxes and social security contributions generally appear to have been progressive, there is no such clear trend for the next six richer deciles. In particular, from the 5^{th} to 10^{th} decile the average taxes and social security contributions were between 8.5% and 11.5%, with the exception of the 9^{th} decile where this percentage was 13.1. This seems to violate even more the principal of progressivity of the Greek system, as far as taxes and social security contributions are concerned. The households of the 10^{th} decile, with almost double the average total income of those of 9^{th} decile, pay a considerably lower portion of their income in taxes and social security contributions.

It is, therefore, obvious that the richest households pay on average considerably less for taxes and social security contributions than expected. These results provide strong evidence on the tax evasion that takes place in this group of households. The high tax evasion, especially among the rich households in Greece, has already been reported in a number of studies (Karageorgas 1973, Karageorgas and Pakos 1988, Negreponti-Delivanis 1990). Karageorgas (1973) and Karageorgas and Pakos (1988) estimated

that tax evasion in upper income groups results in a reduction of approximately three-quarters of the taxes that these groups are obliged to pay according to Greek legislation. It is also well known that a large part of the household income in Greece comes from the informal sector.

Is this evasion on income tax and social security contributions associated only with high incomes? Are there other factors that could provide further and more detailed explanations of this evasion? The analysis of the income distribution by income components helps to shed more light on this issue. As Table 5.3.b (Chapter 5) has shown, the percentages of taxes and social security contributions seem to be associated not with the total household income, but with the share of wages and salaries in the total income. The group of households of the 9th decile, which, as a whole, have the highest average proportion of wages and salaries to total household income, are also the group that pays the highest average percentages of taxes and social security contributions. Similarly, the groups of households of the 6th and 7th decile, which have almost identical average shares of wages and salaries in total income, have also the same percentages of taxes and social security contributions. By contrast, the average wages and salaries of the households of the 10th decile - although as an absolute amount (Table 5.3.a) are almost the same with those of the 9th decile - represent only a small fraction of households' total income. Therefore, the average percentage of taxes and social security contributions that the households of the 10th decile pay - although their total income is almost double than that of the households of the 9th decile - is considerably lower than those of the 8th and 9th deciles. The 10th decile is the only decile where the income from entrepreneurial activities is the main source of household income. In fact, 52% of the total entrepreneurial income is

attributed to the households of the 10th decile (Table 5.3.c). It seems, therefore, that tax evasion is higher among incomes from entrepreneurial activities.[5]

6.4 Evidence Based on the Decomposition of Inequality by Factor Components.

The above findings could have significant policy implications for Greek and EU actions and interventions. These results could prove to be of particular importance to the design and implementation of tax and social security policies in Greece. The decomposition analysis of inequality by income source has proven to be particularly revealing on this issue. The general results of this analysis have already been discussed in Chapter 5, and a part of them has also been examined in Papatheodorou (1998a and 1998b). In this section the attention will be focused only on those findings that are related to the impact that taxes and social security contributions appear to have on the distribution of household income.

It was found that entrepreneurial income, although it represents only 21% of the total household gross income, is by far the most significant source of inequality (Table 5.4). More than 65% of the overall inequality of gross household income is attributed to this source. It was also shown that the most effective way of reducing the overall inequality is by reducing the inequality of entrepreneurial income. By eliminating the inequality of entrepreneurial income alone, the overall inequality of gross income would be expected to decrease by 57%. By contrast, eliminating the inequality of the

[5] Negreponti-Delivanis (1990) has argued that tax evasion in Greece mainly concerns the self-employed. Athanassiou (1984) also showed that in 1975 the declared income to tax authorities represented only 29.9% of the relative figure in National Accounts; entrepreneurial income represented only 3% of the relevant figure.

wages and salaries alone - which represent the 38.3% of total gross income - and leaving the distribution of the remained sources of income unchanged, would reduce the overall inequality by only 3%. It appears that policy makers could achieve better results in reducing the overall inequality by decreasing the inequality of property income instead, although it represents only 4.2% of the average gross income.

When the inequality in question becomes that of the disposable household income, the influence of each individual source to overall inequality changes considerably (Table 5.5). Generally, taxes and social security contributions appeared to have a small negative effect on the total inequality. This decrease in inequality does not have a similar (proportional) impact on the contribution of each individual source. Entrepreneurial income and property income appeared now to have an even larger contribution to the overall inequality of disposable household income. By contrast, the proportional contribution of wages and salaries has been reduced significantly. The contribution of the other main sources to the overall inequality is also reduced, but this reduction is rather marginal. Therefore, the negative contribution that taxes and social security contribution appear to have on the overall inequality of disposable income could be seen as mainly associated with the reduction of the contribution of wages and salaries. In other words, a large part of this reduction in overall inequality has to be attributed to the decrease in inequality of (post-tax) wages and salaries caused by taxes and social security contributions.

Despite that, there is no way to reduce inequality of total household income further by equalising the distribution of wages and salaries alone while the (absolute) distribution of income of the rest of sources and taxes and social security

contributions remain unchanged. On the contrary, such an attempt is expected to increase the overall inequality substantially. Thus although the wages and salaries appear to contribute positively to the overall inequality of disposable household income, the equalisation of the distribution of wages and salaries alone will also have a positive effect on the overall inequality. This paradox is manly due to the way that income taxes and social security contributions are associated with wages and salaries. The redistributive impact that taxes and social security contributions have on the overall inequality of disposable income is mainly exhausted in the reduction of the inequality of wages and salaries. Keeping the absolute (not proportional) distribution of taxes and social security contribution unchanged, any further attempt to reduce the inequality in the distribution of wages and salaries alone would now reduce the redistributive impact that income taxes and social security contributions have. In other words, any further decrease in the inequality of wages and salaries alone - given that the distribution of income of the rest of sources and the taxes and social security contributions remained unchanged - would now over-compensate the decrease of the inequality of total disposable income that the actual (unchanged) absolute distribution of income taxes and social security contributions has caused.[6] By simply eliminating the inequality of entrepreneurial income alone, the overall inequality of disposable income is expected to be reduced by 60%. From a policy perspective, the importance

[6] This will be more easily understood if we keep in mind that the income taxes and social security contributions were considered as a source of income with negative value. Let us use a hypothetical society of two persons A and B whose incomes are attributed only to two sources: wages and property. A's income consists of 80 units of property and 60 units of wages. B's income consists of 160 units of wages and 40 units of property. Now suppose we introduce a progressive income tax of 0% if total income is below 60 units, and 50% if it is above that. Suppose also that these people have the opportunity, the capability and, of course, the will not to declare their property income to tax authorities (although it is illegal). Their actual disposable incomes will become A′=80+60=140 and B′=40+160-50=150. There is obviously less inequality now. If, furthermore, we try to eliminate the inequality of wages and salaries alone but keep the distribution of income of the rest of the sources, as well as the absolute distribution of taxes and social security contributions unchanged, the disposable incomes of these two persons will become A″= 80+85=165 and the B″=40+85=125. We can see now that by eliminating the inequality of wages alone - in this hypothetical society - the overall inequality of

of reducing inequality of entrepreneurial income as the most - if not the only - effective way to reduce the overall inequality is apparent. As was previously noted, a simple increase of the tax rates, without a change in the current structure of the Greek tax system, could be expected to have only a marginal impact on the reduction in overall inequality, or even increase it (see also Papatheodorou 1998a and 1998b).

6.5 Taxes and Contributions by Income Source: Regression Analysis I

The analysis so far has provided evidence on the impact that taxes and social security contributions appear to have on the overall distribution of household income. It has also shown that the share of household income that goes for taxes and social security contributions is affected by the structure of household income, as far as the contribution of each individual source is concerned. Could we elucidate this issue further?

In order to investigate more analytically the nature of these relationships, we will first estimate the correlation between the percentage of taxes and social security contribution that a household pays, and a number of variables which are supposed to influence this percentage. First, the total household income has to be considered, since - according to the Greek tax system - it is recognised as the most important factor in defining the proportion of income that households have to pay for taxes and social security contributions.[7] In addition, the shares of each of the main sources of income

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disposable income is increased.

[7] Since the equivalent income is used in this analysis, the influence of the differences on the composition of households is not considered separately.

in total household income are also considered in order to investigate how and to what extent the structure of household income affects the percentage of taxes and social security contributions that households have to pay. The analysis above has already shown that this percentage is affected by the way that particular sources of income contribute to total household income. In other words, in this analysis we wish to test the hypothesis that income units with incomes from particular sources are more capable of avoiding taxation. This could also provide more precise estimates on how tax evasion is spread among the individual sources of income. On the other hand, it is known that the rural income was mainly excluded from taxation and social security contributions.[8] Therefore, the households that receive a high proportion of their income from rural activities are expected to pay a considerably lower percentage of taxes and social security contributions. The individual sources of income we consider here are the wages and salaries, the entrepreneurial income, the property income, the rural income, and the income from social security.

Table 6.1 provides a matrix with estimates of the correlation coefficient (Pearson) among the above variables.[9] As can be seen, the percentage of taxes and social security contributions is strongly correlated only with the share of salaries and wages in total household income. This correlation is positive, which means that the higher

[8] It is known that incomes from agricultural activities were - up to a certain level - mainly excluded from taxation and these households were not obliged to make social security contributions. This, in practice, results in tax and contributions avoidance even by households with particularly high incomes from agricultural activities (see Chapter 2).

[9] In sections 6.5 and 6.6, 19 questionnaires were (additionally) excluded from the analysis because the information on the share of taxes and social security contributions in household total income was considered unrealistic. This is because the estimates on correlation coefficients, regression coefficients, as well as on the slope and the position of the relevant regression lines that are presented in these sections, are very sensitive to some extreme values, and thus these questionnaires might have influenced them to some extent. However, considering the size of the sample, these cases would not have any considerable effect on the summary measures, the aggregate statistics and the tables we have already presented. Therefore, taking into account the amount of other valuable information that these questionnaires contained, we found it reasonable not to exclude them from the analysis in the rest of the

the share of wages and salaries in total household income, the higher the percentage of taxes and social security contributions becomes that households have to pay. By contrast, the total household income, which - as already mentioned - was expected to be the main determinant of the percentage of taxes and social security contributions, has a very weak positive correlation. In other words, the effect that the total household income has alone is almost negligible. Plotting also the percentages of taxes and social security contribution against the values of the total household income, they did not appear to follow a pattern that could indicate a strong association of any type (Figure 6.2.a).

The correlation among the percentages of taxes and social security contributions and the variables of the share of each of the other individual sources of income (except, of course, wages and salaries) in total household income are particularly small and also negative. An increase of the share of each of these individual sources of income in total household income could expect to have a negative, though negligible, effect on the percentage of taxes and social security contributions. None of them could explain alone a large part of the variation of the percentages of taxes and social security contributions.

A great deal of these negative correlations could be explained by the way in which these variables are correlated between them, and in particular with the share of salaries and wages in total household income. An increase in the share of each of these individual sources of income in total household income is expected to have a negative effect on the share of salaries and wages (as well as the share of each of the

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chapters.

other sources). Indeed, as Table 6.1 shows, these variables are correlated negatively between them. Therefore, these negative associations, given the strong positive correlation between the share of salaries and wages and the percentage of taxes and social security contributions, could partly explain these negative (but low) values of the correlation between the shares of the other sources of income and the percentage of taxes and social security contributions.

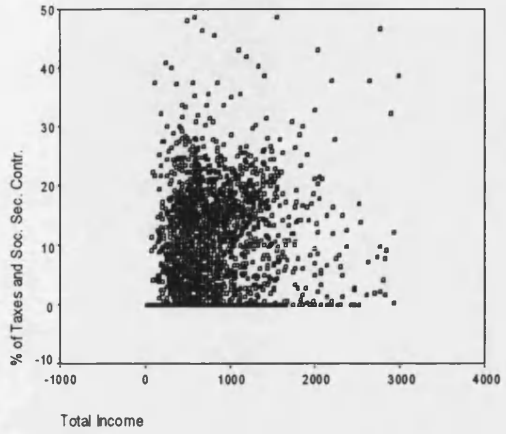
Table 6.1: Correlation coefficients among the percentage of taxes and social security contributions, total household income and the shares of the main individual sources of household income.

Variables	*% of Taxes & Social Sec. Contr.*	*Total household Income*	*% of Wages & Salaries*	*% of Entrepr. Income*	*% of Property Income*	*% of Rural Income*	*% of Soc. Sec. Income*
% of Taxes & Soc. Sec. Contr.	1.000	0.160*	0.642*	-0.121*	-0.056*	-0.389*	-0.186*
Total household Income	0.160*	1.000	0.053*	0.192*	0.079*	-0.101*	-0.140*
% of Wages and Salaries	0.642*	0.053*	1.000	-0.310*	-0.123*	-0.339*	-0.468*
% of Entrepr. Income	-0.121*	0.192*	-0.310*	1.000	-0.054*	-0.175*	-0.268*
% of Property Income	-0.056*	0.079*	-0.123*	-0.054*	1.000	-0.098*	-0.025*
% of Rural Income	-0.389*	-0.101*	-0.339*	-0.175*	-0.098*	1.000	-0.200*
% of Income from Social Security	-0.186*	-0.140*	-0.468*	-0.268*	-0.025*	-0.200*	1.000

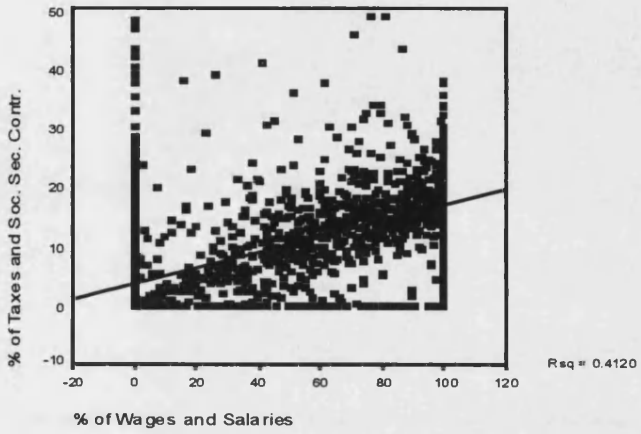
* Correlation is significant at the 0.01 level (2-tailed)

Figure 6.2: Scatterplots of the economic variables of interest against the percentage of taxes and social security contributions.

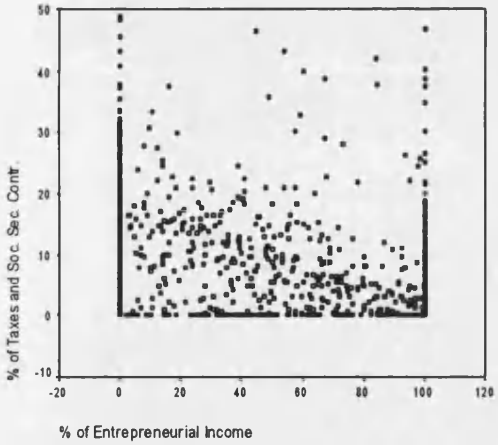
a



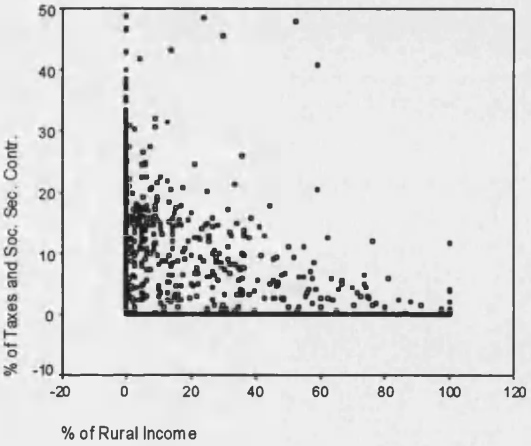
b



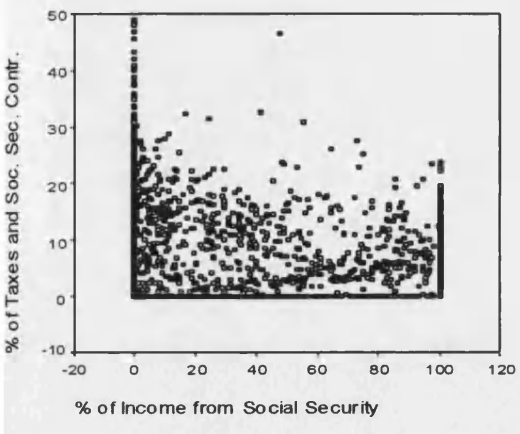
c



d



e



At this point, it is worth commenting further on the correlation between the share of rural income and the percentages of taxes and social security contributions. The value of the relevant correlation coefficient is –0.389, and, although it is not considered high, it has a more significant influence on taxes and social security contributions than the other variables have (except, of course, of the influence that the percentage of salaries and wages have). The value of this coefficient could not be explained only by the correlation that this variable has with the percentage of salaries and wages. This could also be attributed to the exclusion of rural incomes, as already noted, from taxation and social security contributions. That is also the reason why they are significantly underrepresented in the statistics of declared income (see also Chapter 2).[10]

It is thus clear that, among the income variables we have examined, the percentage of salaries and wages in total household income is by far the only variable that appears to have alone a strong correlation with the proportion of household income that goes for taxes and social security contributions.

How strong is the proportion of wages and salaries to total household income as a predictor of the percentage of taxes and social security contributions? In order to investigate further the nature of this relationship, as well as to examine to what degree the proportion of wages and salaries influences the percentage of taxes and social security contributions, regression analysis was used. Plotting the data of the percentages of taxes and social security contribution against the percentages of wages and salaries in the total household income, it appears that the points are not randomly

[10] This issue is also discussed in more detail in section 6.7.

scattered over the grid but follow a pattern (Figure 6.2.b). Households with a high share of wages and salaries in total household income have also a high percentage of taxes and social security contributions. This type of relationship between the two variables could be represented by a straight line with a positive slope. In order to explore further this relationship between the two variables, a simple linear regression analysis was used.

The following variables were used:

- **TSP** : The percentage of taxes and social security contribution to total household equivalent income
- **SWP**: The percentage of salaries and wages to total household equivalent income.

Initially, we estimated the following regression equation with the TSP as the dependent variable and SWP as the independent.[11]

$$\underset{}{\hat{TSP}} = \underset{(22.26)}{3.569} + \underset{(45.22)}{0.131}SWP \qquad (6.1)$$

$$R^2 = 0.412, \qquad SEE = 6.599$$

where the figures in parenthesis are t-ratios, R^2 is the adjusted coefficient of determination and SEE is the standard error of estimates.

[11] These are Ordinary Least Squares (OLS) estimates.

As we can see from this equation, the share of salaries and wages in total household income (SWP) could explain 41% of the variation of the percentage of taxes and social security contribution (TSP). The slope is positive and its value is 0.131. Therefore, an increase of 1% of the share of wages and salaries in total household income is expected to increase the percentage of taxes and social security contribution that the household has to pay by 0.131.

6.6. Taxes and Contributions by Principal-Source of Income: Regression Analysis II

The above analysis has provided particular estimates on the association between the percentage of taxes and social security contribution and the share of wages in total household income. It mainly focused on the profound linear association that was found between these two variables. Plotting the values of each of the other variables in question against the percentages of taxes and social security contributions, they did not appear to follow a pattern that could indicate a strong association of any type (Figure 6.2.a, c, d, e).

Despite this, there is a need to provide more explicit evidence and explore these relationships in more detail. One way to do this is by investigating the distribution of taxes and social security contributions among those households the income of which is attributed mainly to one source. We, therefore, formed four groups of households according to the four main sources: wages and salaries, entrepreneurial income, rural income and social security income. Each group was composed of households where

more than 95% of income was attributed to the relevant source of income. Table 6.2 presents the distribution of these groups of households according to deciles of gross income and the percentage of taxes and social security contributions. The deciles are those based on the total gross household income for all households of the survey. Overall, 1,334 households were found having more than 95% of their income attributed to only one of the main sources; 572 of them to wages and salaries, 217 to entrepreneurial income, 187 to rural income, and 358 to social security.

The first observation one should make is that the group of households, the income of which is attributed to wages and salaries, pay almost three times as much taxes and social security contributions than those with entrepreneurial income or social security income. Since these extreme differences could be attributed to the different proportional distribution of households of each income source to these income brackets, it would be more appropriate for comparative purposes to use standardised values. This is the overall mean of taxes and contributions, if the households of each group were equally distributed among income deciles with the current average total percentage of taxes and social security contribution in each decile. This also allows us to compare these estimates with the relevant figures for all the households as presented in Table 5.3 (Chapter 5).

The standardised values also show that the "wages and salaries" group of households still pay on average a share of their income for taxes and social security contributions that is almost three times higher than that paid by the "entrepreneurial income" group. Those households in the "rural income" group do not appear to pay any taxes and social security contributions. Finally, the "social security income" group was found to

be paying on average less than the half of the percentage that the "wages and salaries" group does. It seems, therefore, that the source of income influence significantly the taxes and social security contributions that a household actually pays.

Table 6.2: Percentage of taxes and social security contributions by income deciles for the groups of households where more than 95% of income is attributed to only one source.

	Wages and Salaries		Entrepreneurial Income		Rural Income		Social Security Income		All Households
DECILES	n	% of Taxes and Soc. Sec. Cont.	n	% of Taxes and Soc. Sec. Cont.	n	% of Taxes and Soc. Sec. Cont.	n	% of Taxes and Soc. Sec. Cont.	% of Taxes and Soc. Sec. Cont.
1	*26*	*4.70*	*12*	*9.09*	*45*	*.35*	*61*	*1.29*	*4.1*
2	*36*	*10.70*	*20*	*3.74*	*30*	*.00*	*38*	*5.67*	*4.4*
3	*47*	*12.99*	*18*	*2.88*	*19*	*.00*	*55*	*5.60*	*6.3*
4	*56*	*16.18*	*28*	*2.74*	*22*	*.19*	*41*	*6.93*	*7.5*
5	*58*	*16.58*	*12*	*4.97*	*11*	*.00*	*43*	*6.04*	*8.5*
6	*67*	*17.92*	*23*	*5.49*	*11*	*.00*	*35*	*4.96*	*9.9*
7	*64*	*17.01*	*20*	*2.89*	*13*	*.00*	*33*	*9.33*	*9.9*
8	*72*	*17.78*	*27*	*5.18*	*14*	*.00*	*19*	*8.35*	*11.5*
9	*92*	*18.07*	*12*	*5.56*	*7*	*.27*	*13*	*9.99*	*13.1*
10	*54*	*19.16*	*45*	*8.01*	*15*	*.16*	*20*	*8.69*	*10.6*
TOTAL	**572**	***16.18***	**217**	***5.18***	**187**	***.13***	**358**	***5.84***	***10.0***
Standar. Total		**15.11**		**5.06**		**0.10**		**6.69**	**10.0**

Note: deciles ranked by gross household income

First, we have to comment on the fact that the households where more than 95% of income is attributed to rural activities paid almost nothing for taxes and/or social security contributions. Special tax allowances for farmers that applied at the time of this survey, resulted in income from agricultural activities being largely exempted from any income taxes and social security contributions (Livada 1988). Despite this, people with income from rural activities are entitled to a (uniform) pension and other social security provisions (i.e. health care) which cannot be seen as related to any sort of contribution. The intention for these special tax and contribution allowances was initially to encourage low-income agricultural households to carry on with their activities during a period when these households were generally very poor. This was also justified by the fact that rural income is considered quite vulnerable, since agricultural production may be affected considerably by a number of factors such as weather variations (see also Chapters 2 and 3). That could have significant implications to the standard of living for those low-income households the income of which is mainly dependent on agricultural production. The analysis shows that even households in this group that are quite wealthy have benefited by these regulations and have paid nothing for taxes and social security contributions. Of course, as mentioned above, this occurred despite the fact that they have benefited from the old age pensions schemes and health care, as well as from other social security provisions.

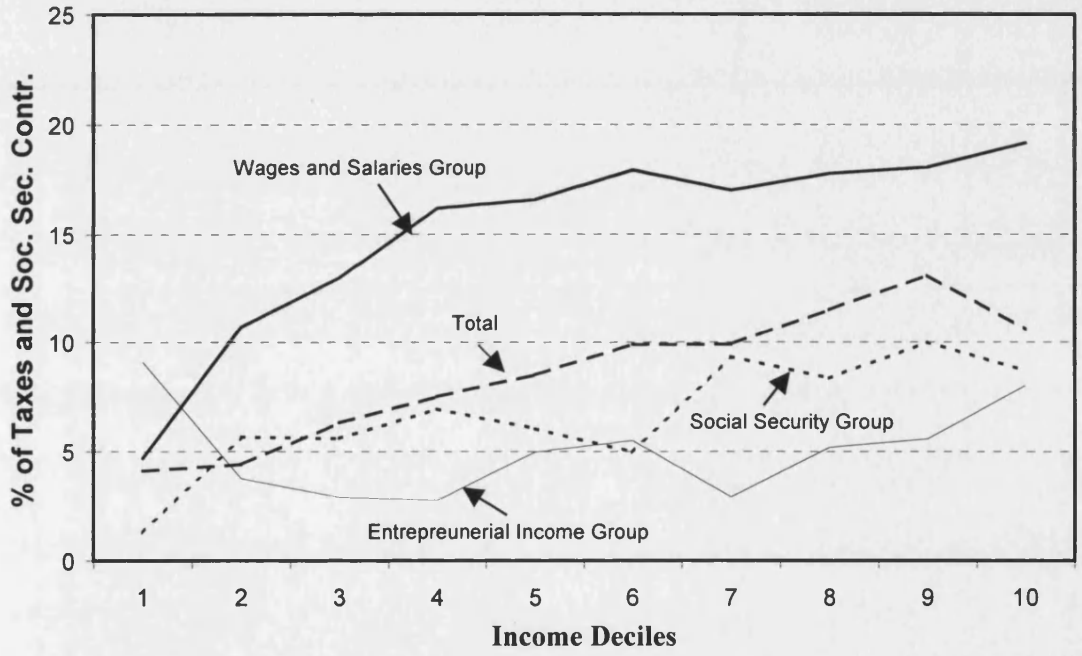
It is of course known, and is further discussed in more detail in the following chapters, that rural households are still among the poorest in Greece. This can also be seen in Table 6.2, where the large number of households the income of which is mainly attributed to rural activities are in the two lower deciles. The above could explain and justify the use of special income tax and social security allowances to the low-income

households in the rural sector. However, it cannot justify the fact that even particularly rich households with income from rural activities have greatly benefited from these regulations. Among 10% of the richest households, those households the incomes of which derive mainly from rural activities pay almost nothing in taxes and social security contributions. By contrast, those households in the "wages and salaries" group pay respectively more than 16% and those in the "social security" group almost 9%; the relevant figure for all households is 10.6%. These special tax and contribution allowances have a similar effect on those households the income of which is attributed to more than one source. The higher the share of income from rural activities, the less is the proportion of their income that goes for taxes and social security contributions.

The percentages of taxes and social security contributions are also relatively low among those households where more than 95% of income is attributed to social security. This low percentage could be partly attributed to the fact that the households of this group do not actually have to pay social security contributions. Additionally, a number of social security payments are excluded from taxation. Despite this, these households appeared to be the second most important contributors - the first being the "wages and salaries" group - as far as the share of income that goes for income taxes and social security contributions is concerned. It should also be mentioned that the percentages of income taxes and social security contributions do not appear to be strictly progressive. In general, these percentages are higher for the households in the four richest deciles, while the lowest percentage appeared in the poorest decile. In spite of this, the households of the 7^{th} and 9^{th} deciles pay a higher proportion of their income for taxes and social security contributions than those in the 10^{th}. Similarly, the

households of the 2nd to 5th deciles pay higher contributions than those in the 6th (see also Figure 6.3).[12]

Figure 6.3: Percentages of taxes and social security contributions by income deciles, according to household groups where more than 95% of income is attributed to only one source.



The figures concerning the taxes and social security contributions for households, where more than 95% of income is attributed to entrepreneurial activities are

[12] One explanation for these variations is that this category may include a number of pensioners receiving pensions from abroad. These are people who were mainly emigrants and came back to Greece when they retired or families of emigrants (i.e. widows) that are entitled to a pension from abroad. It has to be taken into account that a great number of Greeks had emigrated before the 1980s. Since their pensions were issued from abroad, they were not considered as pensions by the tax authorities in all cases. It was, therefore, easier for these pensioners to benefit from special tax

surprisingly low. Overall, the standardised share of household income of this group that goes for taxes and social security contribution is lower than in other groups (with the exception, of course, of the "rural income" group where special allowances held). This figure represents almost one third of the relevant figure for the "wages and salaries" group and half of that for all households. These results provide additional evidence of the high tax evasion that takes place in incomes from entrepreneurial activities. The average percentages of taxes and social security contributions that these households pay in each decile do not show any apparent association with total income. As it is presented in Figure 6.3, this group of households has the most unclear pattern in the way that these percentages are distributed among different income brackets, in comparison with the other two groups of households as well as with the total households of the sample.

In general, the average percentages of taxes and social security contribution that the "entrepreneurial income" group of households is paying are lower than those paid by the other two groups ("wages and salaries" and "social security") and by the total households. This is the case in all deciles with the exception of the first decile.[13] This is rather surprising. In the lowest decile this figure is 9.1% and is substantially higher than the relevant figures of the other two groups in the same decile. This is also the highest among those relevant figures in the other deciles of the same group of households. In other words, the households the income of which is mainly attributed to entrepreneurial activities pay the highest percentages for taxes and social security contributions in the lower decile.

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allowances, held for incomes from abroad or even to avoid declaring these incomes to tax authorities.

[13] This group of households appeared also to pay marginally higher percentages for taxes and social security than the group of "social security income" in the 6th decile.

This paradox could be explained by the fact that it was compulsory for a large number of non-agricultural self-employed, small entrepreneurs and traders to be insured and to pay social security contributions to one particular pension fund (TEBE). There is a minimum (flat rate) contribution that a number of self-employed had to pay every month in order to be allowed to exercise their activities.[14] These are not strictly income-related contributions, and even if their actual incomes were zero the self-employed would have to pay these contributions. Only when a self-employed person interrupts her/his activities s/he may stop paying these contributions. Similarly, particular categories of self-employed or small entrepreneurs have to also pay taxes for a certain amount of income that is predefined by tax authorities according to the kind of activity, the period it is exercised, the qualifications of the self-employed and so on. This would hold even if their actual income were below this level. Therefore, these "flat-rate" social security contributions and/or the non income-related amount of taxes that particular categories of self-employed, traders or small entrepreneurs have to pay, represent a much higher portion of the income of the low-income groups.[15] These two factors could provide an explanation for the fact that the households of this group appeared to pay the highest percentage of taxes and social security contributions in the lower income decile.

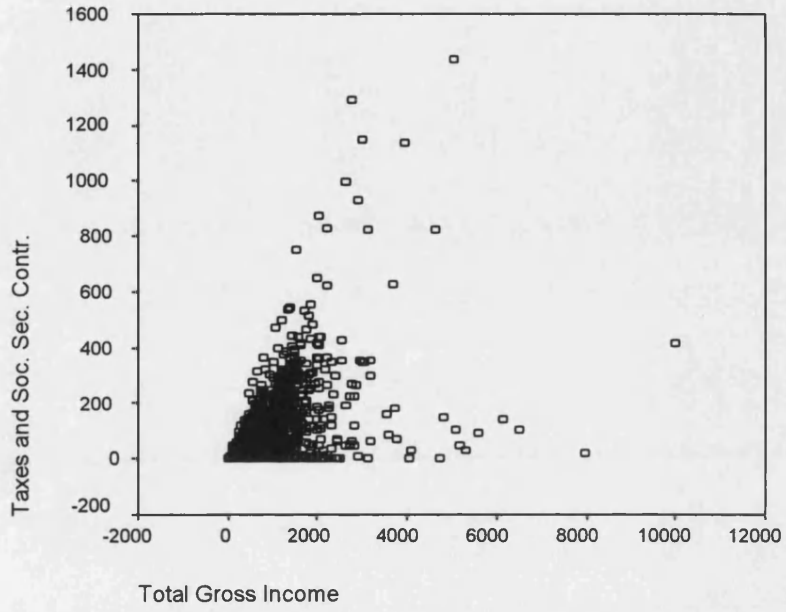
[14] Self employed, traders and small entrepreneurs usually put themselves on the lowest contribution class which might be well below their actual incomes or the average income of the sector (OECD 1997b). Therefore, their contributions could be seen more as flat-rate contributions than as income related. The Greek public pension system is very complicated, without proper accounting and administration. Therefore, it becomes very vulnerable to abuses and "contribution evasions" (OECD 1997b).

[15] The sharp differences in average income between some particular deciles have to be taken into account. Thus the average household income of the first decile is almost half of that of the second decile.

Finally, the households where more than 95% of income is attributed to wages and salaries is the group that pays by far the highest percentage for taxes and social security contributions than any other group. It is also the only group that has a more profound association between total income and the percentage of taxes and social security contributions. As can be seen in Figure 6.3, the share of income that goes for taxes and contributions increased relatively sharply between the 1st and the 4th decile and then continued to increase less sharply until the 6th decile. Between the 6th and 8th this share was constant and it increased again in the 9th and 10th decile. It could thus be argued that the taxes and social security contributions are progressively imposed on those households the income of which is mainly attributed to wages and salaries. The only exception concerns the households of the 7th and 8th deciles, which pay a marginally lower percentage of taxes and contributions than those of the 6th decile. Overall, the taxes and social security contribution seem to have a redistributive impact on this group of households.

The above associations between these income components and the taxes and social security contribution can also be explored using regression analysis. First, the relevant scatterplot for the total households of the sample does not reveal any profound association of any type between the household income and the taxes and social security contributions (Figure 6.4). The value of the correlation coefficient between these two variables is found equal to 0.476, which shows a weak positive linear association between these two variables.

Figure 6.4: Scatterplot of taxes and social security contributions by total income for all households.



Thus a linear regression equation can be tested. The following variables were used:

- **TS**: The total amount of (equivalent) income taxes and social security contribution.
- **GIN:** The total gross household income

We estimated the following regression equation for the total number of the cases with the TS as the dependant and GIN as the independent variable:

$$\hat{TS} = \underset{(9.59)}{22.91} + \underset{(29.22)}{0.066}GIN \qquad (6.2)$$

$$R^2 = 0.226 \qquad SEE = 93.128$$

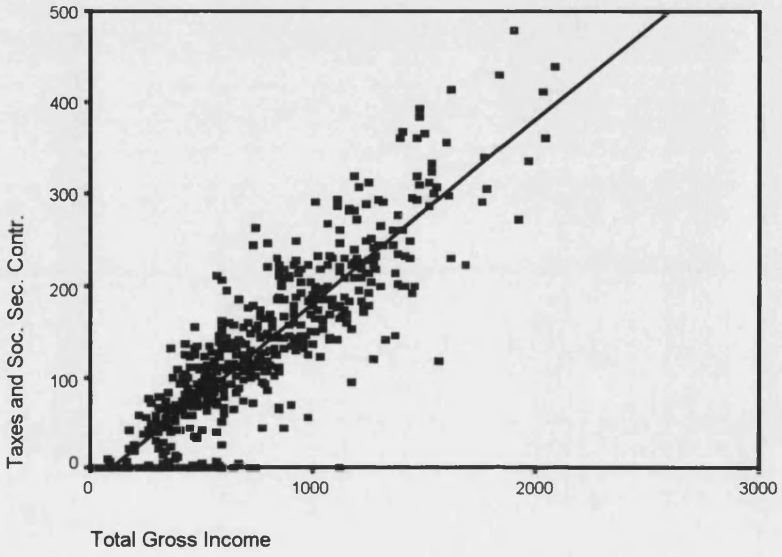
With the value of R^2 equal to 0.226, it is obvious that this model provides a poor prediction of the household taxes and contributions. The variation of total income alone could explain only a very small part of the variation of taxes and social security contributions and, as a result, the variation of their share in total household income. More than 77% of the variation of the taxes and contributions are not explained by this model. Therefore, this equation cannot be considered as having important explanatory power.[16]

The close positive association between the wages and salaries and the taxes and social security contributions can also be explored by employing a regression analysis. Plotting the data of the total household income against the absolute amount of taxes and social security contributions for the group of households with more than 95% of their income deriving from wages and salaries, we can see that the points follow a clear pattern (Figure 6.5a). The high-income households have also high taxes and social security contributions. A straight line with a positive slope could represent this relationship well. Therefore, a linear regression equation can be used.

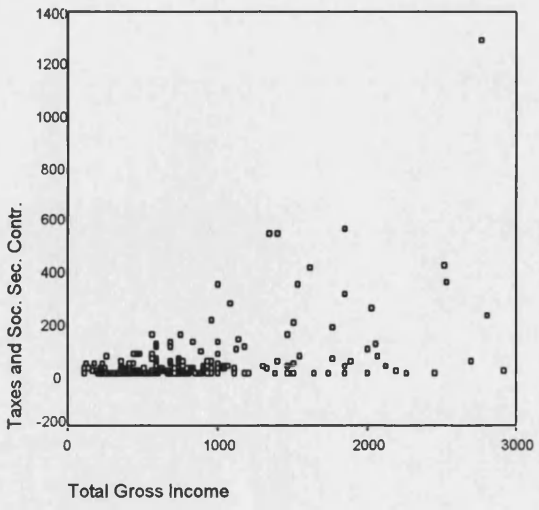
[16] Even when other, non-linear regression models were applied, the value of R^2 for the association between total income and taxes and social security contributions for the total households remained very low.

Figure 6.5: Scatterplots of taxes and social security contributions by total income for those groups of households where more than 95% of income is attributed to only one source.

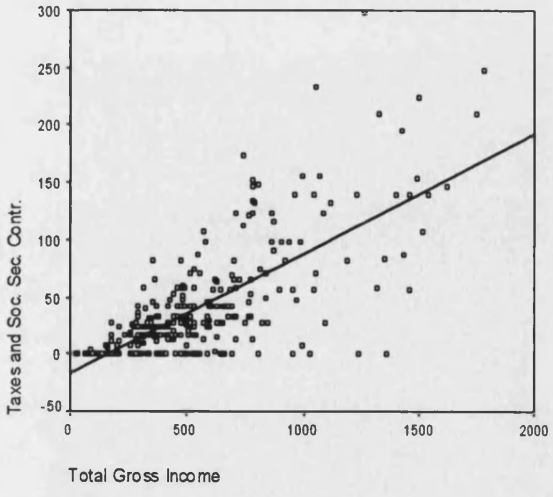
a: "Wages and salaries" group of households



b: "Entrepreneurial income" group of households



c: "Social security income" group of households



We estimated the following regression equation with the TS as the dependant and GIN as the independent variable:

$$\hat{TS} = \underset{(-7.30)}{-31.434} + \underset{(45.35)}{0.216GIN} \qquad (6.3)$$

$$R^2 = 0.783, \qquad SEE = 53.444$$

The model has a very good fit with the value of adjusted R^2 equal to 0.738. This means that the variation of total household income alone for those households with more that 95% of income deriving from wages and salaries, explain almost three-quarters of the variation of taxes and social security contributions. The slope is positive and its value is 0.216. This shows that an increase of total income by one unit would increase the taxes and social security contributions by 0.216 units.

Since the percentage of taxes and social security contributions in this group of households are shown to be slightly progressive (Figure 6.3, Table 6.2), a function that represents a non-linear relationship between total income and taxes and social security contributions could prove to be more representative. A quadratic function was thus tested. The following model was used:

$$TS = a + b_1 GIN + b_2 GIN^2 + u_i$$

where GIN^2 is the total gross household income squared and u_i is the stochastic term. Assuming that $E(u_i) = 0$, the following equation was estimated:

$$\hat{TS} = \underset{(-2.35)}{-13.435} + \underset{(19.598)}{0.1793GIN} + \underset{(4.681)}{0.000013GIN^2} \qquad (6.4)$$

$$R^2 = 0.790, \qquad SEE = 52.490$$

The quadratic equation (6.3) provides a slightly better prediction on the variation of taxes and social security contributions than the linear equation (6.2). The curves that correspond to the linear and quadratic equations are presented in Figure 6.6. Since the estimated parameter b_2 is positive, the curve of the function is U-shaped.[17] The slope at any point of the curve is given by

$$\frac{dTS}{dGIN} = 0.1793 + 0.000013GIN$$

which is the first derivative of the function in respect to GIN.

The slope of this curve (for positive incomes) is always positive.[18] The slope itself is, of course, a linear function of total household income. Therefore, for any increase of

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[17] Since

$$\frac{d^2TS}{dGIN^2} = 0.00013 > 0$$

the function has a minimum and, therefore, has a shape of U.

[18] Since

$$\frac{d^2TS}{dGIN^2} > 0$$

the function has a minimum at the point where the first derivative is equal to zero:

$$\frac{dTS}{dGIN} = 0$$

$$0.1793 + 0.000013GIN = 0$$

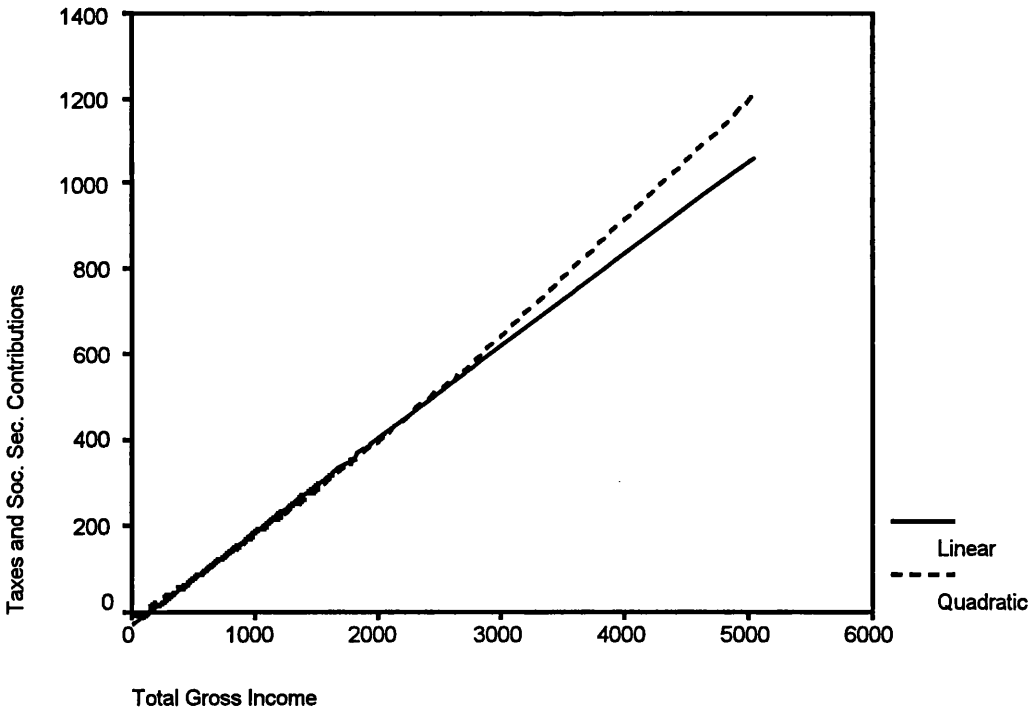
$$GIN = -13792.3$$

Therefore, for positive incomes the slope will be always positive and increasing with respect to GIN.

$$\frac{dTS}{dGIN} > 0$$

total income by one unit the slope is expected to increase by 0.000013 units. The higher the household income, the higher the slope will be. Thus for any increase of household income, the amount that goes for taxes and social security contributions is expected to grow increasingly larger. This reflects the progressiveness of taxes and social security contributions in this particular group of households.[19]

Figure 6.6: Curves that represent the quadratic and linear functions on the relationship between taxes and contribution and total income for those households the income of which is attributed mainly to wages and salaries.



[19] Of course, the value 0.000013 is quite small and is indicative of the low progressiveness that the

One issue that needs to be explored is how these results compare with those concerning the associations between total household income and taxes and social security contributions in the other household groups, the income of which is mainly attributed also to one source. The estimated (Pearson) correlation coefficient for the "entrepreneurial income" group is equal to 0.401. This shows that there is only a very small positive linear association between these variables. The relevant scatterplot for taxes and social security contributions and household income for this group shows that the points are not following any particular pattern that could indicate a strong association of any type (Figure 6.5b). On the contrary, the group of households where more than 95% of income is attributed to social security shows a more profound association (Figure 6.5c). The correlation coefficient is estimated to be 0.717, which indicates a positive association. This relationship could, therefore, be explored further using a simple linear regression model. The following regression equation was estimated with TS as the dependant variable and GIN the independent:

$$\underset{}{\hat{TS}} = \underset{(-3.180)}{-9.887} + \underset{(19.386)}{0.09GIN} \qquad (6.5)$$

$$R^2 = 0.512, \qquad SEE = 34.8542$$

The model fits well and the adjusted R^2 is equal to 0.512. This means that more than 50% of the variation of taxes and social security contributions could be explained by the variation of total income alone. The slope is positive and its value is 0.09. Therefore, an increase of 1 unit to the total income of this group would be expected to

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income taxes and social contributions have on the actual incomes even among this group of households.

increase taxes and social security contributions by 0.09 units. Comparing with equation 6.3 we will notice that the slope of equation 6.5 is less steep. This reflects the lower average percentages of taxes and social security contributions that this group of households pays compared to the wages and salaries group.

6.7 Conclusions

The main aim of this chapter was to investigate the distributional impacts of income taxes and social security contributions. The evidence provided in the previous chapters has shown that they have a weak redistributive effect on household income. Since this contradicts the intended effect of the progressive income taxation on the distribution of income, it was considered necessary to undertake a more in depth analysis.

This analysis helped to shed more light and provide additional information on an issue for which limited research has been conducted in Greece, mainly due to lack of appropriate data and information. A number of aspects were investigated using a database that does not have the same drawbacks as those that were broadly available and used so far by the researchers in the field. These results could have significant policy implications for Greek and EU policy actions and interventions. Researchers, policy analysts and policy makers in this area could, therefore, benefit greatly from these findings, since they provide additional information for appraising and evaluating the performance of income taxes and social security contributions with respect to a number of social and economic issues.

Despite the progressive income taxation that has been imposed by the Greek legislation, the results show that the after-tax and social security contributions household income is only marginally more equally distributed than gross income. In addition, the households in the richest (10^{th}) decile pay a considerably lower proportion of their incomes for taxes and social security contributions than what those in the 8^{th} and 9^{th} deciles do. This evidence supports the findings of other studies as far as the tax evasion among the high-income population in Greece is concerned.

The analysis of the distribution of household income by sources of income helped to shed more light on the issue. The tax and contribution evasion appears to be mainly associated not with the total income, but with the structure of income as far as the contribution of each individual source is concerned. The household groups with high average shares of wages and salaries in total income also pay high average percentage of taxes and contributions. Tax evasion appears to be higher among incomes from entrepreneurial activities.

The decomposition analysis of inequality showed clearly that entrepreneurial income is by far the main contributor to inequality, despite the fact that it represents a relatively small fraction of the overall income. Apparently, the most effective way to eventually reduce inequality is by reducing the inequality of disposable incomes of entrepreneurs. The distributional impact of income taxes and social security contributions is mainly exhausted in reducing the inequality of wages and salaries. A further reduction of inequality of wages and salaries alone - given that the distribution of income of the rest of the sources and that the taxes and social security contributions

remained unchanged - would not have any significant impact on the overall inequality. An increase of tax rates without structural changes of the current tax system should only marginally contribute to the reduction of overall inequality. These results stress the importance of redesigning or reforming the current tax system in Greece so that it becomes effective enough to eliminate the tax and contribution evasion mainly among the recipients of entrepreneurial income. This policy could prove the most efficient - if not the only way - to make the system more effective for achieving its distributional goals.

The close relationship between the taxes and social security contributions and the various income components were further explored by employing regression analysis. The percentage of taxes and social security contributions appeared to be strongly associated only with the percentage of wages and salaries to household income. The variation of the share of wages and salaries alone could explain more than 40% of the variation of the percentage of taxes and contributions. None of the other sources of income (as shares of total household income) or the total income alone were found to have a large association of any type with the percentage of taxes and contributions.

Finally, the analysis of the distribution of taxes and social security contributions by total household income for those groups of households with more than 95% of income deriving from one of the main sources of income, provided more explicit evidence on this issue. The group of "wages and salaries" appeared to pay significantly higher percentages for taxes and social security contributions than the other groups. It is also the only group where these percentages appeared to be generally progressive. The regression analysis shows that almost 80% of the variation of taxes and contributions

could be explained by the variation of total income. By contrast, these variables do not show any similar strong association for the other groups of households.

Those households with more than 95% of income deriving from rural activities pay literally nothing for taxes and social security contributions. These results were anticipated since special taxes and contribution allowances that were introduced in the past - when these households were considered quite poor - still hold. Although these special allowances are justified in the case of low income households of this group - the income of which is considered quite vulnerable due to a number of factors - in the case of particularly rich households which also benefit greatly, these special allowances cannot be justified. These groups additionally benefit from the old age pensions and from health and other social security provisions without having to pay any sort of contributions. These effects are, of course, spread to those households the income of which is attributed to more than one source.

The households in the "social security income" group pay on average for taxes and social security contributions less than half of the percentage that households in the "wages and salaries" group pay. This low percentage could be partly explained by the fact that these households do not have to pay social security contributions and, additionally, a number of allowances are generally excluded from taxation. Similarly, the actual tax rates did not appear to have any considerable distributional impact on this group of households. On the other hand, the "social security income" group was the only other group of households, after "the wages and salaries" group, that appeared to have a strong association between total income and taxes and social

security contributions. The variation of total income in this group explains alone more than 50% of the variation of taxes and social security contributions.

Finally, the households the income of which is mainly attributed to entrepreneurial activities pay a surprisingly low average percentage in taxes and social security contributions. This figure represents only one third of the relevant figure for the "wages and salaries" group and almost half for total households. The distributions of taxes and social security contributions in this group do not show any profound association of any type with total income. This is the group in which the highest tax evasion is observed. The special legislation that makes it compulsory for a certain number of self-employed and small entrepreneurs to pay a certain minimum amount for contributions and taxes - for as long they exercise their activities - has influenced only the low-income households of this group. The higher income households of this group appear to be particularly skilled at tax and contribution avoidance.

The significant policy implications of these findings are apparent. Among other things, these findings could prove of particular importance for the design and implementation of tax and social security policies in Greece. In general, these results stress the importance of redesigning or reforming the current tax and social contribution system in order to become more effective in achieving its distributional goals. The elimination of tax evasion mainly among the recipients of entrepreneurial income has to be the main priority.

CHAPTER SEVEN

ANALYSIS OF INEQUALITY BY POPULATION SUBGROUPS

7.1 Introduction

It is generally supported that a large part of income inequality may be explained by the different characteristics of the income recipient unit. Based on empirical results, a number of theories have emphasised the role of certain attributes in explaining the income differences among persons. The question that this chapter seeks to answer concerns the extent to which certain characteristics of the unit of analysis could explain income inequality in Greece.

Initially, in this chapter, the income differences of certain population subgroups are investigated. Although the emphasis is placed in the differences of the average disposable income, additional estimates on the synthesis of household income, as far as the contribution of each individual source is concerned, are also presented. It is of equal importance to know the disparities in the structure of income between different household subgroups. This analysis is quite revealing for understanding and explaining income differences among the population subgroups. The evidence in Chapter 5 has already shown the importance of the distribution of income from certain

sources to the overall inequality. Such information may prove of crucial importance for policy makers in evaluating, as well as designing and implementing more effective policy interventions in tackling inequality and poverty.

Despite the fact that the above analysis is quite helpful for understanding income differences between certain population subgroups, it does not say much about the extent to which these differences could explain the overall inequality. How much of the overall inequality could be explained by the way that income is distributed within population subgroups? This is also an area on which only limited research has been carried out in Greece.[1] The policy implications of these questions are apparent. If inequality is mainly attributed to within-group inequality, a policy for reducing the income differences between certain population subgroups might not have any effect on the overall inequality. In order to investigate these issues, inequality is decomposed into within-group and between-group components. A number of alternative indices are used in order to capture the different aspects of inequality and assess the robustness of the results.

[1] The only known similar studies that attempted a decomposition analysis of inequality into between and within population subgroups in Greece were those of Carantinos (1981), Tsakloglou (1988) and Lazaridis et al (1989). They all analysed inequality using the information from FESs. Carantinos (1981) used grouped data on household consumption from the 1974 Family Expenditure Survey (FES) and provided estimates on a limited number of population groups. Tsakloglou (1988) used micro-data on consumption from the 1974 and 1981/82 FESs (see also Tsakloglou 1989, 1993). Lazaridis et al (1989) used income and consumption expenditure micro-data from the 1981/82 FES.

7.2 Distribution of Income According to Household Characteristics

One variable that has been extensively used by researchers in the field is that of household composition. As already mentioned, equivalent income is used in this analysis in order to make households of different size and composition comparable. Since in this analysis the distribution of income according to the size and the composition of households is in question, additional estimates on total (non-equivalent) household income, and per capita disposable income are presented as well. The results are shown in Figure 7.1. We can see that, when we make no use of any equivalence scale there is a positive relationship between the number of household members and the average total disposable income, for up to four member households. Any additional member after the fourth was found to have a negative impact on overall income.[2] Household income is positively but less than proportionately related to household size. In other words, any additional member increases the average per household income but reduces the per capita household income. This is in line with the findings of a number of relevant studies (e.g. Kuznets 1976). The per capita income appeared to have a negative relationship with household size, the only exception being households with three members the average income of which is almost equal to that of two-member households. Finally, the equivalent income is also associated negatively (but less sharply than the per capita income) with the size of a household. There is, of course, the exception of two-member households, the average equivalent income of which is lower than that of the household groups with three and four members.

[2] Only 14.5% of the households in our sample had more than four members (Table 7.1).

The composition of the household appears to be reflected not only in the total household income but also in its synthesis, as far as the contribution of each individual source is concerned. Therefore, the analysis by income source proved quite revealing in understanding and explaining particular issues of the distribution of income among these population subgroups. Table 7.1 presents the distribution of equivalent disposable income, gross income from various sources, and taxes and social security contributions by the size and the composition of household. We need to remember that in this study all men of 65 years and above and all women of 60 years and above are defined as "elderly". All members below 16 years of age, as well as full time students below 25 who live with their parents are defined as "children".

Figure 7.1: Average total, equivalent and per capita disposable household income by number of members per household.

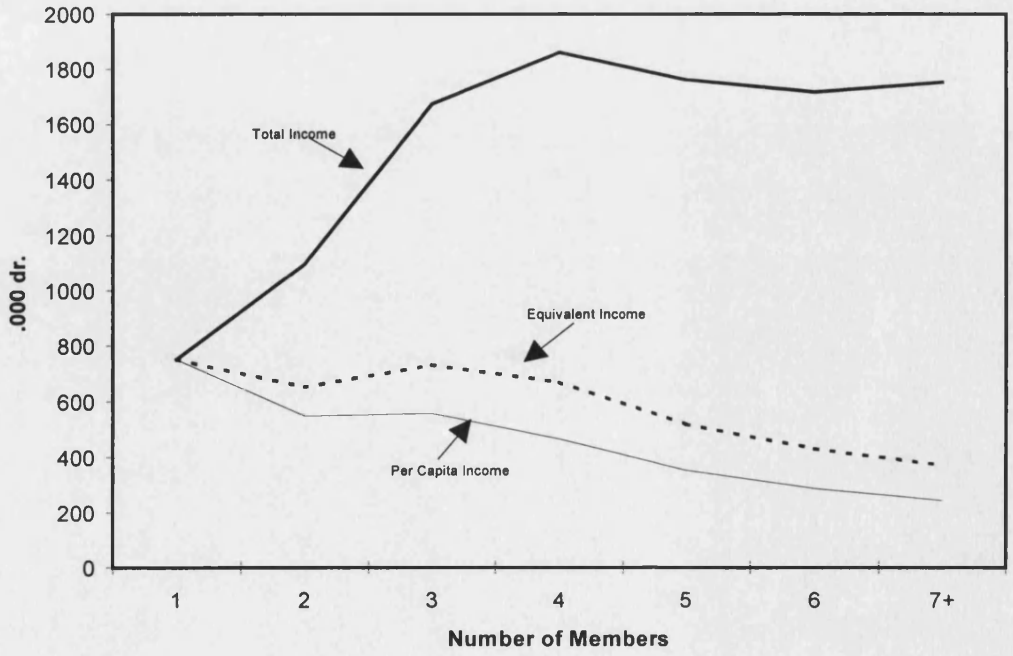

Table 7.1: Equivalent gross household income from various sources, disposable income and taxes and social security contributions by household types.

Household Types	SOURCES OF INCOME								Average Gross Equiv. Income	Taxes & Soc. Secur. Contrib.	Average Dispo-sable Equiv. Income	*N*
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources				
					Pensions	*Other Trans.*	Total					
a. Total average annual incomes (.000 dr.).												
1 MEMBER	**261**	**98**	**41**	**37**	**284**	**3**	**287**	**100**	**824**	**73**	**752**	*356*
1 adult	493	180	42	50	91	5	96	151	1011	108	903	*185*
1 elderly	9	10	40	23	493	1	493	46	622	35	588	*171*
2 MEMBERS	**216**	**114**	**37**	**93**	**218**	**1**	**219**	**43**	**721**	**70**	**652**	*809*
2 adults	378	196	42	150	117	1	119	23	908	101	807	*360*
2 elderly	4	19	33	43	367	0	367	24	489	24	465	*245*
1 ad. & 1 child	353	75	51	24	35	1	37	170	709	74	635	*34*
1 ad. & 1 eld.	173	94	24	65	279	2	281	25	661	77	584	*149*
Other	0	32	67	6	53	0	53	514	671	3	668	*21*
3 MEMBERS	**326**	**195**	**29**	**97**	**128**	**3**	**130**	**37**	**815**	**84**	**730**	*634*
3 adults	318	277	17	165	93	3	95	10	883	82	801	*173*
2 ad. & 1 child	480	219	27	54	58	3	61	27	869	107	762	*240*
1 ad. & 2 child.	214	23	34	17	89	3	92	329	709	60	649	*33*
2 ad. & 1 eld.	212	123	30	154	213	1	214	3	736	60	676	*90*
Other	104	114	52	59	296	3	298	43	669	62	607	*98*
4 MEMBERS	**380**	**215**	**29**	**71**	**45**	**4**	**49**	**9**	**754**	**85**	**669**	*716*
2 ad. & 2 child.	431	234	30	60	21	5	26	10	791	98	693	*396*
3 ad. & 1 child	368	121	26	75	54	2	56	4	650	76	575	*94*
4 adults	367	137	32	72	38	4	42	2	652	62	590	*84*
Other	256	271	26	95	111	4	116	17	779	67	712	*142*
5+ MEMBERS	**187**	**114**	**16**	**132**	**71**	**3**	**74**	**5**	**529**	**48**	**481**	*425*
2 ad. & 3 child.	278	189	29	77	20	4	24	4	602	75	527	*87*
2 ad. 1 elderly & 2 child.	125	84	11	206	136	1	137	1	564	40	525	*42*
Other	170	97	13	138	76	3	79	6	503	42	462	*296*
TOTAL	**281**	**154**	**31**	**87**	**143**	**3**	**146**	**35**	**734**	**74**	**660**	*2940*

Table 7.1 -continued

Household Types	SOURCES OF INCOME								Average Gross Equiv. Income	Taxes & Soc. Sec. Contrib.	Average Dispo-sable Equiv. Income	*N*
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources				
					Pensions	*Other Trans.*	Total					
b. As percentage of gross household income (%)												
1 MEMBER	**31.6**	**11.9**	**5.0**	**4.5**	**34.4**	**0.3**	**34.8**	**12.2**	**100**	**8.8**	**91.2**	*356*
1 adult	48.8	17.8	4.2	5.0	9.0	0.5	9.5	14.9	100	10.7	89.3	*185*
1 elderly	1.5	1.7	6.4	3.8	79.2	0.1	79.3	7.4	100	5.6	94.4	*171*
2 MEMBERS	**30.0**	**15.8**	**5.1**	**12.9**	**30.2**	**0.2**	**30.3**	**5.9**	**100**	**9.7**	**90.3**	*809*
2 adults	41.7	21.6	4.6	16.5	12.9	0.2	13.1	2.5	100	11.1	88.9	*360*
2 elderly	0.7	3.8	6.8	8.8	74.9	0.0	74.9	5.0	100	5.0	95.0	*245*
1 ad. & 1 child.	49.7	10.6	7.2	3.4	5.0	0.2	5.2	23.9	100	10.4	89.6	*34*
1 ad. & 1 eld.	26.2	14.2	3.6	9.9	42.2	0.3	42.4	3.7	100	11.7	88.3	*149*
Other	0.0	4.7	9.9	0.8	7.9	0.0	7.9	76.6	100	0.4	99.6	*21*
3 MEMBERS	**40.0**	**23.9**	**3.6**	**12.0**	**15.7**	**0.3**	**16.0**	**4.5**	**100**	**10.3**	**89.7**	*634*
3 adults	36.0	31.4	2.0	18.7	10.5	0.3	10.8	1.1	100	9.2	90.8	*173*
2 ad. & 1 child	55.2	25.3	3.1	6.2	6.7	0.4	7.0	3.1	100	12.3	87.7	*240*
1 ad. & 2 child.	30.2	3.2	4.8	2.4	12.5	0.4	12.9	46.4	100	8.5	91.5	*33*
2 ad. & 1 eld.	28.8	16.7	4.1	20.9	29.0	0.1	29.1	0.5	100	8.2	91.8	*90*
Other	15.5	17.0	7.8	8.8	44.2	0.4	44.6	6.4	100	9.3	90.7	*98*
4 MEMBERS	**50.5**	**28.6**	**3.8**	**9.4**	**6.0**	**0.6**	**6.6**	**1.2**	**100**	**11.2**	**88.8**	*716*
2 ad. & 2 child.	54.5	29.6	3.8	7.6	2.7	0.6	3.2	1.2	100	12.4	87.6	*396*
3 ad. & 1 child	56.5	18.7	4.1	11.6	8.3	0.3	8.6	0.5	100	11.6	88.4	*94*
4 adults	56.2	21.1	5.0	11.0	5.8	0.7	6.5	0.2	100	9.5	90.5	*84*
Other	32.8	34.7	3.3	12.2	14.3	0.6	14.8	2.2	100	8.6	91.4	*142*
5+ MEMBERS	**35.4**	**21.6**	**3.1**	**25.0**	**13.4**	**0.6**	**13.9**	**1.0**	**100**	**9.1**	**90.9**	*425*
2 ad. & 3 child.	46.2	31.4	4.8	12.9	3.3	0.7	4.0	0.7	100	12.5	87.5	*87*
2 ad. 1 elderly & 2 child.	22.2	15.0	1.9	36.4	24.1	0.2	24.4	0.1	100	7.0	93.0	*42*
Other	33.7	19.2	2.7	27.5	15.2	0.6	15.8	1.2	100	8.3	91.7	*296*
TOTAL	38.3	21.0	4.2	11.9	19.5	0.4	19.8	4.7	100	10.0	90.0	*2940*

The share of primary income (wages and salaries and entrepreneurial income) in total equivalent household income is positively associated with the number of members for the up to four-member households (Table 7.1b). By contrast, the share of income from social security and "other sources" was found to have exactly the opposite trend. Therefore, the lower the number of members, the higher are the shares of these sources in total household income. This is due to the fact that the households with one or two elderly, the incomes of which are mainly attributed to pensions, represent a significant part of the first two household groups.

As Table 7.1a shows, the highest total equivalent disposable income appeared in categories "1 adult", "2 adults" and "3 adults". Thus the elderly and children were found to have a negative effect on the total equivalent household income. Children are not usually entitled to any income (from labour) while the main source of income for the elderly are pensions, which are usually significantly lower than the incomes of the employed. Indeed, among the households with one member, the group of elderly was found to have on average an annual income equal to 588 thousand dr., while the relevant figure for adults is 903 (Table 7.1a). The main source of income for the elderly are pensions which represent 79% of their total gross income, while adults' main source of income are wages and salaries which represent 49% of their gross income, followed by entrepreneurial income with 18% (Table 7.1b). Therefore, 67% of adults' disposable income is considered as primary income.

Similarly, among the households with two members the category "2 adults" was found to have the highest average disposable income, followed by the groups "1 adult

& 1 elderly" and "1 adult & 1 child". Finally, the lowest incomes in two-member households appeared in category "2 elderly". The category "other" consists of 5 households with "1 elderly & 1 child" – a small number of cases that cannot be considered separately - and 19 households with two adults who are both below the age of 25 and are full-time students. It was decided that these 19 households would not be included in the category "2 adults". As was noted, those below the age of 25 in full time education who live with their families are considered children by definition. These people live alone, but are financially dependent on their families. Therefore, it was a challenge to examine the structure of their income separately from the group of two adults. Indeed, it was found that this is the group of households with the highest share of income from other sources. Almost 77% of their total disposable income is attributed to "other sources" when the relevant figure for all households is found to be only 4.7%.

One comment that should be made is that the group of households that is expected to consist mainly of one-parent families was not found to have a particularly low disposable income, as evidence in other countries shows (see Layard et al 1978, George 1980a, Piachaud 1982, Hauser and Fisher 1990, and Joseph Rowntree Foundation 1995). On the contrary, their income appeared to be quite close to the total average income for all households. These findings are in line with those of other studies in Greece. The analysis by income source helps to shed more light on this issue. The "income from other sources" was found to represent 46% of the total income for the group of households "1 adult & 2 children" and 29% for the group "1 adult & 1 child". These figures are significantly higher than the relevant average for

all households (4.7%). By contrast the proportion of income from social security in these two groups is much lower than the relative figure for all households. These two categories are usually headed by women, either because they are divorced or the husband has died (lone-parent families) or because the husband is an emigrant or seaman.[3] The latter is a common feature of Greek society, bearing in mind that Greece experienced significant external migration during the 1960s and 1970s, since the available opportunities, particularly in the industrial sector, could not meet the labour supply (Mylonakis 1989). Similarly, a large number of Greeks are working as seamen, occupations that are usually associated with relatively high rewards. Thus a large proportion of the income of these households is attributed to alimonies for former spouse and children, and to remittances from emigrants or seamen.

Finally, the households with five or more members have the highest average proportion of rural income to total income than other household groups. Rural income represents 25% of their total income, where the relevant figure for all households is only 12%. It seems that large families are more common in rural areas. It is also appears that the categories "2 adults, 1 elderly & 2 children" and "2 adults & 1 elderly" are the subgroup with the highest shares of rural income. This indicates that the pattern of elderly (old parent) living with the family of his/her children and not alone, is more common in rural areas.

We have already highlighted part of the impact that children and the elderly have on total household income. It is meaningful to provide some additional evidence that

[3] Indeed, women headed 82% of households in these two groups, when the relative figure for all households is only 16.5 %.

should allow us to clarify further this issue. Table 7.2 presents the distribution of household income by the number of children per household. The highest total equivalent income appeared in the group of households without children. This is also the only group the income of which is well above the relevant average figure for all households. It is, therefore, anticipated that households with children will have a lower equivalent disposable income than households without children will have. Among the households with children, those with 3 children constitute the group that has the higher equivalent disposable income. Despite that, the differences between the average income in all these categories are rather insignificant, with the exception of those households with four or more children. The average income of the latter group is substantially below the total average figure for all households.

Large differences also appeared in the synthesis of household income among these groups. As Table 7.2b shows, more than 70% of the average gross income of those households with children is attributed to wages, salaries, and entrepreneurial activities (primary income) when the relevant figure for all households is 59%. By contrast, the group of households without children is the only group that has a share of social security income that is substantially higher than the relevant figure for all households. This is because a significant part of this group consists of households with elderly members. The group with three children which, as already noted, has also the highest average income among the households with children, is the only group in which the entrepreneurial income is the main source of income. In fact, it is the only group in which entrepreneurial income is substantially higher than wages and salaries and more than double than the relevant figure for all households.

Table 7.2: Equivalent gross household income from various sources, disposable income and taxes and social security contributions by number of children per household.

Number of Children per Household	SOURCES OF INCOME								Average Gross Equiv. Income	Taxes & Soc. Secur. Contrib.	Average Dispo-sable Equiv. Income	*N*
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources				
					Pensions	*Other Trans.*	Total					
a. Total average incomes (.000 dr.).												
0	239	130	32	96	213	2	215	35	746	70	676	*1632*
1	367	149	31	69	85	3	88	27	731	83	648	*502*
2	344	183	28	80	40	4	44	47	726	79	647	*579*
3	235	317	27	87	35	4	39	25	730	71	659	*173*
4+	231	126	15	85	40	3	42	5	504	53	450	*54*
TOTAL	**281**	**154**	**31**	**87**	**143**	**3**	**146**	**35**	**734**	**74**	**660**	***2940***
b. As percentage of gross household income (%)												
0	32.0	17.4	4.4	12.8	28.5	0.3	28.8	4.7	100	9.4	90.6	*1632*
1	50.2	20.4	4.3	9.5	11.6	0.4	12.0	3.6	100	11.4	88.6	*502*
2	47.4	25.2	3.9	11.0	5.5	0.5	6.0	6.5	100	10.9	89.1	*579*
3	32.2	43.4	3.7	12.0	4.8	0.5	5.3	3.4	100	9.8	90.2	*173*
4+	45.8	24.9	3.0	16.9	7.9	0.5	8.4	1.0	100	10.6	89.4	*54*
TOTAL	**38.3**	**21.0**	**4.2**	**11.9**	**19.5**	**0.4**	**19.8**	**4.7**	**100**	**10.0**	**90.0**	***2940***

Overall, we can say that among the households with one to three children - representing 96% of all households with children in our sample - the number of children appeared to be associated positively with the share of entrepreneurial and rural income. However, the number of children appeared to be associated negatively with the share of wages and salaries, property income and social security income. The category of households with four or more children is the one that has the highest

average share of rural income. As we have also seen in table 7.1, large families were more commonly found in rural areas. The relatively small number of cases in this group does not allow us a further classification and a more in-depth analysis. An additional comment that should be made is that in this table, as already discussed in Chapter 6, the percentages of taxes and social security contributions appeared also to be associated not with the total income, but with the share of wages and salaries in total gross household income.

Finally, as Table 7.3 shows, the number of elderly people per household is negatively related to total equivalent disposable household income. As anticipated, the number of elderly per household has a positive relationship with the proportion of pensions to gross income and a negative relationship with the share of salaries and wages and entrepreneurial income (Table 7.3b).

One figure that is also important in investigating the distribution and the synthesis of household income is that of the number of income providers (see Deleeck et al 1991). Income provider is considered to be the member who earns incomes from wages or salaries, entrepreneurial activities, rural activities, property, pensions, and other social security transfers. As it is shown in Table 7.4, the lowest disposable equivalent income appeared in the group of households with no income providers. The only source of income for this group, as expected, was from "other sources" (Table 7.4b). This means that the incomes for these households are solely attributed to remittances, alimonies and so on.

Table 7.3: Equivalent gross household income from various sources, disposable income and taxes and social security contributions by number of elderly per household.

Number of Elderly per Household	SOURCES OF INCOME								Average Gross Equiv. Income	Taxes & Soc. Secur. Contrib.	Average Dispo-sable Equiv. Income	*N*
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources				
					Pensions	*Other Trans.*	Total					
a. Total average incomes (.000 dr.).												
0	380	204	31	91	63	3	67	42	815	89	725	*1897*
1	136	72	29	90	275	2	277	23	626	53	573	*644*
2+	42	51	34	69	309	2	310	19	525	33	492	*399*
TOTAL	**281**	**154**	**31**	**87**	**143**	**3**	**146**	**35**	**734**	**74**	**660**	***2940***
b. As percentage of gross household income (%)												
0	46.7	25.0	3.8	11.1	7.8	0.4	8.2	5.2	100	11.0	89.0	*1897*
1	21.8	11.5	4.6	14.3	43.9	0.3	44.2	3.7	100	8.5	91.5	*644*
2+	8.0	9.7	6.5	13.2	58.8	0.3	59.1	3.6	100	6.3	93.7	*399*
TOTAL	**38.3**	**21.0**	**4.2**	**11.9**	**19.5**	**0.4**	**19.8**	**4.7**	**100**	**10.0**	**90.0**	***2940***

The highest disposable income appeared in the group of households with two income providers. This is also the only group in which the share of wages and salaries in total household income is higher than the relevant figure for all households. Overall, the primary income in this group represents more than 65% of total household income. The households with one income provider have also a relatively high average disposable income. In fact, these two groups are the only groups with average disposable income higher than the relative figure for all households. These are also the groups with the highest primary income.

Table 7.4: Equivalent gross household income from various sources, disposable income and taxes and social security contributions by number of income providers per household.

Number of Income Providers	SOURCES OF INCOME								Average Gross Equiv. Income	Taxes & Soc. Secur. Contrib.	Average Dispo-sable Equiv. Income	*N*
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources				
					Pensions	*Other Trans.*	Total					
a. Total average incomes (.000 dr.).												
0	0	0	0	1	0	2	2	547	551	7	544	*72*
1	253	179	44	37	188	3	190	36	739	73	665	*1236*
2	351	157	26	103	126	3	128	14	778	88	691	*1175*
3	234	121	15	201	99	3	101	7	680	54	626	*312*
4+	190	69	13	195	70	2	72	4	544	40	504	*145*
TOTAL	**281**	**154**	**31**	**87**	**143**	**3**	**146**	**35**	**734**	**74**	**660**	***2940***
b. As percentage of gross household income (%)												
0	0.0	0.0	0.0	0.3	0.0	0.3	0.3	99.4	100	1.3	98.7	*72*
1	34.3	24.2	5.9	5.0	25.4	0.4	25.8	4.8	100	9.9	90.1	*1236*
2	45.1	20.2	3.3	13.2	16.1	0.3	16.5	1.8	100	11.3	88.7	*1175*
3	34.5	17.8	2.2	29.6	14.5	0.4	14.9	1.0	100	7.9	92.1	*312*
4+	35.0	12.6	2.4	35.9	12.9	0.3	13.3	0.8	100	7.3	92.7	*145*
TOTAL	**38.3**	**21.0**	**4.2**	**11.9**	**19.5**	**0.4**	**19.8**	**4.7**	**100**	**10.0**	**90.0**	***2940***

The households with four or more income providers have the lowest average income. This is also the only group of households in which rural income becomes the main source of income. By contrast, the shares of entrepreneurial and social security incomes in this group are the lowest (among those households with income providers). Therefore, this group consists mainly of low-income farmers where almost all the adult members of the family are occupied in rural activities, or families whose members are in low-paid, part time or temporary jobs. Bearing also in mind the results of Table 7.1, where the large-size households were found to have the lowest

equivalent income, we have to be rather sceptical about the extent to which the presence of large families could be interpreted simply as a cultural phenomenon. An additional or alternative explanation is that large families are a necessity for those with low income, who pool their efforts and incomes in order to benefit from the economies of scales in consumption. Overall, among those households with income providers, the number of income providers is associated positively with the share of agricultural income in gross household income and negatively with the shares of entrepreneurial and social security incomes.

A lot of emphasis has also been placed by many researchers and policy-makers in the differences between certain household attributes and, in particular, the level of welfare, according to the degree of urbanisation (rural and urban areas). This is usually defined administratively by the size of the community, municipality or city to which the household belongs. The regional factor could, therefore, be considered as a household characteristic. According to the definition followed in the sample design (Chapter 4), the households were grouped into three categories: urban areas, semi-urban and rural areas.[4] As Table 7.5 shows, there are, indeed, significant differences in the average household income according to the degree of urbanisation. The households in urban areas had an average income well above the relevant figure for all households. The lowest disposable income appeared in rural households.

[4] Urban areas: cities of 10000 inhabitants and over. Semi-urban areas: municipalities and communes of 2000-10000 inhabitants. Rural areas: municipalities and communes of less than 2000 inhabitants.

Table 7.5: Equivalent gross household income from various sources, disposable income and taxes and social security contributions by locality.

Area	SOURCES OF INCOME								Average Gross Equiv. Income	Taxes & Soc. Secur. Contrib.	Average Dispo-sable Equiv. Income	*N*
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources				
					Pensions	*Other Trans.*	Total					
a. Total average incomes (.000 dr.).												
Urban	375	191	41	10	174	3	177	46	839	97	742	*1817*
Semi-urban	233	147	21	105	102	3	106	26	638	66	572	*285*
Rural	94	78	12	249	90	2	92	14	539	27	512	*838*
TOTAL	**281**	**154**	**31**	**87**	**143**	**3**	**146**	**35**	**734**	**74**	**660**	***2940***
b. As percentage of gross household income (%)												
Urban	44.7	22.7	4.9	1.2	20.7	0.3	21.0	5.5	100	11.5	88.5	*1817*
Semi-urban	36.6	23.0	3.3	16.4	16.0	0.5	16.6	4.2	100	10.3	89.7	*285*
Rural	17.4	14.5	2.2	46.2	16.8	0.4	17.1	2.5	100	5.0	95.0	*838*
TOTAL	**38.3**	**21.0**	**4.2**	**11.9**	**19.5**	**0.4**	**19.8**	**4.7**	**100**	**10.0**	**90.0**	***2940***

Significant differences are also observed in the synthesis of household income among these categories. Those living in urban areas have the highest share of wages and salaries in total household income. Overall, the primary income for this group represents more than 67% of the total income. By contrast, the share of rural income is only 1.2%. The main source of income for households in semi-urban areas is also wages and salaries, followed by entrepreneurial income. Rural income in this group also represents a relatively small proportion of total equivalent household income, although this share is above the average for all households. The households in rural areas are those with rural income as the main source of income. It is important to note that rural residences get much more rural income than wages. Indeed, in rural households, rural income appeared to represent more than 46% of the total average equivalent income, while the relevant figure for wages and salaries found was only

17.4%.[5] One comment that should be made is that the households in semi-urban areas have an average income similar to that of households in rural areas, and a synthesis of income which is closer to that of households in urban areas. Therefore, the grouping favoured by some researchers according to which the households in semi-urban areas are classified as rural (based mainly on information about the average income), could obscure the analysis of inequality and could mislead policy interventions.

7.3 Distribution of Income by Attributes of the Head of Household

A number of social and demographic characteristics that are often used in investigating the distribution of household income are related to certain attributes of the head of household. The main reason for this is that the head of household is generally considered to be the main breadwinner. Given also the lack of sufficient information on other members, certain attributes of the head of household may serve as a fair proxy of the general social characteristics, as well the status of a whole household. Similarly, certain household characteristics (i.e. household income) may be also used as a proxy of individual characteristics (individual income) in investigating associations between particular individual attributes, when the data do not provide detailed information at an individual level. Thus despite the fact that these elements provide only a proxy of the attributes in question, they could prove to be helpful in analysing particular aspects of inequality when there is insufficiency of detailed data. Those individual characteristics that are found to be associated with the

[5] This could be explained by the high population share of farmers in Greece, who live mainly in rural areas (see Table 7.8).

distribution of income, and which have been used extensively in relevant studies are age, education, and occupational status of the head of household.

Table 7.6 presents the distribution of household income by the age of the head of household. The relationship between household income and age of the head of household has the shape of an inverted U. The average household income increases in the age group 25-34, remains high for the age groups 35-54 and then declines. This is similar to the results for the distribution of income by age of head of household in other countries (Atkinson 1983). The lowest incomes are observed at the age groups "under 25" and "65+".

In the first age group ("under 25") the adult is often unemployed or recently introduced into the labour market, with no experience and, therefore, with a salary or wages which are relatively low. This age group comprises also the full time students who do not live with their parents, but are financially dependent on them. Thus the income from "other sources" is the main income source in this group. It represents 43% of total gross income while the relevant figure for all households is only 4.7%. (Table 7.6b).

In those households where the head of household is older than 24, the head's age is associated negatively with the share of wages and salaries. When the person is young, his/her main asset is his/her labour and thus the main sources of income are wages and salaries. As the head of household becomes older, the property (savings, investments) of the household usually increases and thus the share of property income rises as well.

Entrepreneurial income is an important contributor to the households in Greece with head in the age brackets "35-54". It seems that in this age group adults are more competent in entrepreneurial activities and/or at this age they manage to maximise rewards from these activities.

Table 7.6: Equivalent gross household income from various sources, disposable income and taxes and social security contributions by age of head of household.

Age of Head of Household	SOURCES OF INCOME								Average Gross Equiv. Income	Taxes & Soc. Secur. Contrib.	Average Dispo-sable Equiv. Income	*N*
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources				
					Pensions	*Other Trans.*	Total					
a. Total average incomes (.000 dr.).												
Under 25	283	53	20	24	28	2	29	308	718	50	668	*102*
25-34	493	167	18	56	28	6	34	53	821	108	713	*417*
35-44	424	225	18	73	28	2	30	25	795	93	701	*570*
45-54	320	214	36	135	73	4	76	16	798	79	720	*659*
55-64	185	138	40	123	203	1	204	16	707	63	644	*606*
65+	45	44	39	44	374	1	375	25	571	40	532	*586*
TOTAL	**281**	**154**	**31**	**87**	**143**	**3**	**146**	**35**	**734**	**74**	**660**	***2940***
b. As percentage of gross household income (%)												
Under 25	39.5	7.4	2.8	3.3	3.9	0.2	4.1	43.0	100	7.0	93.0	*102*
25-34	60.0	20.3	2.2	6.8	3.5	0.7	4.2	6.4	100	13.1	86.9	*417*
35-44	53.4	28.3	2.2	9.2	3.5	0.3	3.8	3.1	100	11.8	88.2	*570*
45-54	40.1	26.9	4.5	16.9	9.1	0.5	9.5	2.0	100	9.8	90.2	*659*
55-64	26.2	19.5	5.6	17.4	28.7	0.2	28.9	2.3	100	9.0	91.0	*606*
65+	7.8	7.6	6.8	7.8	65.5	0.2	65.7	4.3	100	6.9	93.1	*586*
TOTAL	**38.3**	**21.0**	**4.2**	**11.9**	**19.5**	**0.4**	**19.8**	**4.7**	**100**	**10.0**	**90.0**	***2940***

Rural income is associated positively with the age of the head of household (with the exception of course of the "65+" age group were the adult is usually retired). This is

mainly attributed to three factors. First, older people usually own the larger and thus richer farms. This is because the young farmers usually inherit their farms from their parents and thus quite frequently they have to share them with other relatives (mainly brothers and sisters). Second, during the last three decades, there has been a rapid decrease of people occupied in rural activities. This reflects partly the changes in the structure of Greek production, and partly the substitution of labour by machines in agricultural production. In addition, due to low incomes - traditionally associated with rural activities - a large part of people moved to other activities. It is obvious that in both cases the younger are more flexible in moving out of rural activities and seeking a job in another sector. Third, also due to the low income in the agricultural sector, adult children - as already noted - often live with their parents (forming large families) and, therefore, benefit from pooling their efforts and from economies of scales in consumption.

Education is generally considered an important factor in explaining part of the dispersion in incomes.[6] As Table 7.7 shows, the higher the educational level of the head of household, the higher is the household equivalent income. The income differences among household groups according to the educational level of their head are quite sharp. Thus the average disposable income for households the head of which had a university degree appeared two and a half time higher compared to those households the head of which had a "non-primary education". Surprisingly, there are substantial differences between the households with the head in "lower" and "upper

[6] Of course, human capital theorists have emphasised the role of personal education and training as the main determinant factor in explaining differences in earnings (Mincer 1958, 1974, Becker 1964). The present study, as extensively discussed in Chapter 8, is critical of these theories, because they fail to consider other important elements that affect one's income (see also Atkinson 1983).

cycle of secondary education", as well as between those in "university" and "non-university higher education". In particular, when the head of household had a "non-university higher education" the household income appeared significantly lower compared to that of those with a "university education" (72% as much). This is despite the fact that "non-university higher education" in Greece lasts only one year less (3 to 4 years) than "university education (4 to 5 years).[7] These two groups of households have also significant differences in income profiles.

The households in which the head has a "non-university higher education" have also the highest share of wages and salaries (63%) in gross income (followed by those with "university education"). This is also the group that pays the higher percentage for taxes and social security contributions. However, the average wages and salaries are higher in the households in category "university education". We may assume, therefore, that - as a group - those with university education spend fewer working hours on average, but earn more compared to what those with a "non-university higher education" earn.[8] Therefore, it seems that "non-university higher education" has either failed to provide individuals with the right qualification, or that the structure of the Greek market (and society) does not value their degree in a way that would allow these individuals to gain rewards that would differentiate them from those who have only completed their secondary education. Indeed, there are no such sharp differences in total incomes between the households with the head in category

[7] The difference in years (3 to 4 or 4 to 5) is related to choice of subject. Only studies in the medical school last up to 6 years.

[8] Since the contribution of income from entrepreneurial activities in total income is considerably higher for those with "university education", we could assume that on average, they spend less working hours as employees than those with "non-university higher education".

"non-university higher education" and those in "upper cycle secondary school", as well as between those in category "lower cycle school education" and those in "primary education".

Table 7.7: Equivalent gross household income from various sources, disposable income and taxes and social security contributions by the educational level of the head of household.

Education of Head of Household	SOURCES OF INCOME								Average Gross Equiv. Income	Taxes & Soc. Secur. Contrib.	Average Dispo-sable Equiv. Income	*N*
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources				
					Pensions	*Other Trans.*	Total					
a. Total average incomes (.000 dr.).												
University	710	374	79	16	140	2	142	44	1365	179	1186	*241*
Non Univers. Higher Ed.	637	114	53	20	148	2	150	25	999	143	856	*145*
Upper Cycle Sec. School	370	174	46	35	175	3	178	80	884	109	775	*613*
Lower Cycle Sec. School	237	182	31	105	108	2	111	20	685	62	624	*260*
Primary Education	180	132	18	128	124	3	126	21	606	46	560	*1147*
No Primary Education	127	78	12	102	164	3	167	18	504	32	472	*534*
TOTAL	**281**	**154**	**31**	**87**	**143**	**3**	**146**	**35**	**734**	**74**	**660**	*2940*
b. As percentage of gross household income (%)												
University	52.0	27.4	5.8	1.2	10.2	0.2	10.4	3.3	100	13.1	86.9	*241*
Non Univers. Higher Ed.	63.7	11.4	5.3	2.0	14.8	0.2	15.0	2.5	100	14.3	85.7	*145*
Upper Cycle Sec. School	41.9	19.7	5.2	3.9	19.8	0.4	20.2	9.1	100	12.3	87.7	*613*
Lower Cycle Sec. School	34.6	26.5	4.6	15.3	15.8	0.3	16.1	2.9	100	9.0	91.0	*260*
Primary Education	29.7	21.7	3.0	21.2	20.4	0.4	20.9	3.5	100	7.6	92.4	*1147*
No Primary Education	25.2	15.5	2.3	20.2	32.6	0.6	33.2	3.5	100	6.4	93.6	*534*
TOTAL	**38.3**	**21.0**	**4.2**	**11.9**	**19.5**	**0.4**	**19.8**	**4.7**	**100**	**10.0**	**90.0**	*2940*

Overall, there is a positive relationship between educational level and the average wages and salaries, as well as the property income. By contrast, the shares of rural and social security incomes are generally associated negatively with the educational level. It is obvious that the better-educated people are those who have better chances of abandoning rural activities, which are generally associated with low incomes. As also emphasised by a number of researchers, education in Greece has been seen as crucial in Greek society for upward social mobility (Tsoukalas 1986b, Tsoukalas and Panagiotopoulou 1992).[9] Finally, we have to note that the highest percentage of taxes and social security contributions appeared in those households with their head in the category "non-university higher education". As has already been noted, this category has also the highest share of wages and salaries in gross income.

Finally, the occupation of the head of household is often used as an important factor in analysing inequality of household income. It has also been used by a number of researchers as the main indicator in defining the social status of the households. Four occupational categories were used in the present analysis:

I : Professionals and Administrative Executives.

II : Clerical, Tradesmen and Salesmen.

III: Craftsmen, Labourers and Service Workers.

IV: Farmers

[9] These issues are examined in more detail in Chapter 8.

Table 7.8: Equivalent gross household income from various sources, disposable income and taxes and social security contributions by occupational status of head of household.

Occupational Status	SOURCES OF INCOME								Average Gross Equiv. Income	Taxes & Soc. Secur. Contrib.	Average Disposable Equiv. Income	*N*
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources				
					Pensions	*Other Trans.*	Total					
a. Total average incomes (.000 dr.).												
I	746	352	59	15	23	3	27	35	1232	166	1066	297
II	514	377	34	18	46	1	47	23	1013	140	873	356
III	396	218	15	24	32	5	37	9	699	86	613	824
IV	53	38	11	366	62	2	63	7	539	12	527	567
TOTAL	**281**	**154**	**31**	**87**	**143**	**3**	**146**	**35**	**734**	**74**	**660**	***2940***
b. As percentage of gross household income (%)												
I	60.5	28.6	4.8	1.2	1.9	0.3	2.2	2.8	100	13.5	86.5	297
II	50.8	37.2	3.4	1.7	4.6	0.1	4.6	2.3	100	13.9	86.1	356
III	56.6	31.2	2.2	3.4	4.6	0.7	5.2	1.4	100	12.3	87.7	824
IV	9.8	7.1	2.0	68.0	11.4	0.3	11.8	1.3	100	2.2	97.8	567
TOTAL	**38.3**	**21.0**	**4.2**	**11.9**	**19.5**	**0.4**	**19.8**	**4.7**	**100**	**10.0**	**90.0**	**2940**

*It refers to total households of the survey and not to total households the head of which had an occupation. There are 896 households the head of which was found to have no occupation. These are mainly households headed by pensioners, unemployed, unoccupied, students etc.
I: Professionals and Administrative Executives.
II: Clerical, Tradesmen and Salesmen.
III: Craftsmen, Labourers and Service Workers.
IV: Farmers

Table 7.8 shows that household income varies significantly between these different occupational groups in Greece. Households with a head who was professional or administrative executive have by far the highest average household income followed by those in category "clerical, tradesmen and salesmen". These are also the only groups with income above the relevant average figure for all households. The households with the head in categories "craftsmen, labourers and service workers"

and "farmers" were those with the lowest average disposable income. The income differences between these groups are quite sharp. Thus the income of those households with the head in category I is two times higher than the income of households with a farmer head.

Also significant are the differences in the structure of household income among these groups. Those households with the head in category I have wages and salaries as the main source of income. The share of entrepreneurial income in this category, although it is above the relevant figure for all households, is lower than that in households in categories II and III. The other important element is that property income is higher in this group than in any other household group according to this classification.

The households with the head in category II are those with the highest proportion of entrepreneurial income to total income. This is mainly attributed to the fact that this group includes tradesmen (whose income is considered entrepreneurial). Despite that, wages and salaries are still the main source of income in this group, contributing by more than 50% to total household income. Those households in category III had also wages and salaries as their main income source. Entrepreneurial income is also a significant source of income for these households; despite the fact that it represents more than 31% of total household income, its absolute amount is significantly lower than the relevant figures for those households in categories I and II. This, of course, is indicative of the different type of entrepreneurial activities in which the members of the families of these groups were involved. Members of households in category III

are more likely to be involved in small enterprises (small shops etc) or self-employment occupations with low rewards.

Finally, the main source of income (68%) for those households the head of which is a farmer is rural income, as anticipated. It is also the only group in which none of the other sources was found to contribute in any significant way to household income. It seems, therefore, that the members of the households with a farmer head do not have the same chances to gain earnings from activities others than those in the rural sector, as we see happening in other groups. It appears that the majority of the members of these households are occupied in farming (family's farm), while occasionally some might work in a temporary or other relatively low paid occupation.

7.4 Decomposing Inequality by Population Subgroups

We have investigated so far the differences in household incomes between certain population subgroups. It was found that particular social, demographic and regional characteristics could explain part of the differences in average levels of income, as well as in the structure of household income. These estimates, of course, do not tell us anything about how incomes are distributed within these population subgroups. Thus one question that is important concerns inequality within these household groups. Furthermore, from a policy perspective, it is important to know the extent to which the overall inequality is attributable to inequality between population subgroups, and the extent to which it is attributable to the inequality within them. Inequality within

each group can simply be measured by one (or more) of the relevant indices. Although this allows us to compare the inequality among different population subgroups, it does not directly say much about the extent to which this inequality contributes to the overall inequality. In order to investigate these issues, we need to be able to decompose inequality into within-group and between-group components. The between-group component is the inequality that would result if all units of each population subgroup had an income equal to the average income of the subgroup. The within-group component is the inequality that would remain if the average income in all groups were equalised but the inequality within each group remained unchanged. The within-group component is, therefore, the sum of the inequalities within each group, weighted by a coefficient that depends on certain aggregate characteristics. As Cowell (1995) has pointed out, an inequality index is decomposable if the total inequality can be expressed as an aggregate function of the inequality in each subgroup, of the mean income and of the population of each group (see also Cowell 1984). Thus the total inequality for any income distribution can be written as:

$$I_T = F(I_1, I_2, \ldots I_k; \mu_1, \mu_2, \ldots \mu_k; n_1, n_2, \ldots n_k)$$

where I_T is the overall inequality of the population, while I_k is the inequality in group k, μ_k is the mean income in group k, and n_k the population in group k.

Although a large class of inequality indices is decomposable by population subgroup, not all of them are suitable for this purpose.[10] A number of authors have already

[10] As Cowell (1988, 1995) showed, the relative mean deviation, the variance and the logarithmic

discussed extensively the indices that are suitable and have the most desirable properties for this type of exercise (Bourguignon 1979, Cowell 1980, 1988, 1995, Shorrocks 1980, Anand 1983). All inequality indices that are additively decomposable by population subgroup are members of the family of generalised entropy indices E_θ (Shorrocks 1984, Cowell 1995).[11] This family of indices can be expressed in the form:

$$E_\theta = \frac{1}{\theta(1-\theta)}\left[\frac{1}{n}\sum_i\left[\frac{y_i}{\mu}\right]^\theta - 1\right]$$

where θ parameter could take any positive, zero or negative value.

Each index of this family can be additively decomposed as:

$$I_T = I_B + I_W$$

where I_w is within-group inequality and I_B is between-group inequality.

The between-group inequality could be written as:

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variance cannot be decomposed based only on information on group means and populations. He also showed that the Gini coefficient is decomposable only if the subgroups are not overlapping but are strictly ranked by income.

[11] Cowell (1995) also shows that another class of indices that is decomposable by population subgroup is that of kolm indices.

$$I_B = \frac{1}{\theta(1-\theta)}\left[\sum_K \frac{n_k}{n}\left(\frac{\mu_k}{\mu}\right)^{\theta} - 1\right]$$

and the inequality within-group as:

$$I_W = \sum_K \left(\frac{n_k}{n}\frac{\mu_k}{\mu}\right)^{\theta}\left(\frac{n_k}{n}\right)^{1-\theta} I_k$$

where $\frac{n_k}{n}$ is the population share of group k and $\left(\frac{n_k}{n}\frac{\mu_k}{\mu}\right)$ is, therefore, the share of income of group k in total income of the population.

The same results might not be necessarily derived using alternative inequality indices. Each of these indices has particular properties and is more sensitive to differences at different parts of the distribution. The use of a number of alternative indices could prove particularly helpful in revealing different aspects of the issue. It also helps to see if and how the relative contribution of within-group and between-group components is affected by the inequality index. It could thus serve as a test for the robustness of the estimates in each decomposition exercise.

For measuring inequality within each group only, the Gini (G) index and Atkinson indices $A_{(\varepsilon=0.5)}$ and $A_{(\varepsilon=2)}$ were used. These indices have been extensively used by researchers in the field, and were also used for measuring the overall inequality in Chapter 5. $A_{(\varepsilon=2)}$ index is relatively more sensitive to differences at the bottom of the

distribution than $A_{(\varepsilon=0.5)}$, while G is more sensitive to differences at the middle of the distribution. For the decomposition analysis of the inequality the Theil's Entropy index (T), the Mean Logarithmic Deviation (L), and, following Jenkins (1995), the Half the Squared Coefficient of Variation ($C^2/2$) were used. These are also the inequality measures with the most desirable properties for the decomposition analysis and have widely been used in relevant studies (Bourguignon 1979, Jenkins 1995). These three indices are part of the family of Generalised Entropy measures $E_{(\theta)}$: T is the $E_{(1)}$, L is the $E_{(0)}$, and $C^2/2$ is the $E_{(2)}$. Among these indices, L is more sensitive to differences at the bottom of the distribution, whereas $C^2/2$ is more sensitive to differences at the top.

7.5 The Decomposition of Inequality by Population Subgroups: Main Findings

The analysis in Section 7.2 showed that the average income of households in rural and semi-urban areas was well below the relevant figures for all households. The differences in household income according to regional factors have been emphasised by a number of researchers and policy-makers. Indeed, one of the national as well as EU policy priorities during the last decades has been the reduction of the differences in certain macroeconomic indicators among the different geographic areas in Greece.

The analysis in Table 7.9 shows that the degree of urbanisation does not only affect the average amount and the synthesis of household income, but also the way that

income is distributed among the households. All the inequality indices suggest that income inequality among the households in rural areas is much higher than the inequality in urban and semi-urban areas. The inequality in rural areas is substantially higher than the overall inequality. The values of G, $A_{(\varepsilon=0.5)}$ and $A_{(\varepsilon=2)}$ show that inequality in urban and semi-urban areas is almost the same. The Half the Squared Coefficient of Variation ($C^2/2$) is the only index that showed large differences between inequality in urban and semi-urban areas.

These results are in line with those of other studies in the field which have also shown that, generally, inequality in rural areas in Greece is higher than in the urban (and semi-urban) areas (Pashardes 1980a, Carantinos 1981, Athanassiou 1984, Tsakloglou 1989). Tsakloglou (1988, 1989), using data from the 1974 and 1982 Family Expenditure Surveys, found that inequality in urban areas does not vary substantially from inequality in rural areas. The estimates provided by him of Gini and $A_{(\varepsilon=2)}$ indices on 1974 data showed that inequality in rural areas is slightly lower than in urban areas. However, his relevant estimates on 1982 data showed that inequality in urban areas was slightly higher. Part of these differences could be attributed to differences in the classification of households according to the degree of urbanisation. Tsakloglou used only two groups, incorporating households of the semi-urban areas to the rural areas group. Overall, the estimates showing that inequality in rural areas is higher than that of urban areas in Greece seem to be different to what studies in other countries show (Jain 1975). Pashardes (1980a) and Tsakloglou (1989) argued that this could be partly explained by the fact that in this grouping the high income population

that lives in suburban areas around the big cities in Greece is usually included in the rural areas group.

Table 7.9: Decomposition of inequality by the locality of household.

Locality	$\frac{n_k}{n}$	μ_i	G	$A_{(\varepsilon=0.5)}$	$A_{(\varepsilon=2)}$	T	L	$C^2/2$
Urban	0.618	742	0.347	0.107	0.341	0.256	0.212	0.587
Semi-Urban	0.097	572	0.344	0.096	0.353	0.199	0.205	0.238
Rural	0.285	512	0.426	0.154	0.511	0.350	0.331	0.608
Total			0.377	0.124	0.431	0.286	0.259	0.593
Within-Group Inequality						0.272 (95.3)	0.245 (94.7)	0.580 (97.8)
Between-Group Inequality						0.013 (4.6)	0.014 (5.3)	0.013 (2.2)

(The contributions in percentages are in parenthesis)

The indices used in the decomposition of inequality between and within groups show that the between-group inequality accounts for only a small part of the overall inequality. None of the indices shows that more than 5.3% of the overall inequality is attributable to the between-group inequality. The highest contribution (97.3%) that the between-group component has to overall inequality was given by the $C^2/2$ and the lowest (94.7%) by the L. These results agree, in general, with those of Tsakloglou (1988, 1989), although his estimates of the contribution of the between-group inequality were found to be higher. Using Theil's T and N indices and the Variance

of Logs, Tsakloglou estimated the contribution of between-group inequality to be between 9.6% and 10.7% for 1974 and between 9.0% and 9.3% for 1982. These differences could be partly explained by the differences in methodology between Tsakloglou's studies and this present analysis. Tsakloglou's analysis is based on household equivalent expenditure, he used different equivalence scales and - as we have already discussed – a slightly different classification of households according to the degree of urbanisation. Of course, part of these differences may be attributed to the narrowing of the differences in average household income between the rural and urban areas that took place during the years between the surveys used by Tsakloglou and by the present study.

Surprisingly, the results of the decomposition analysis presented here are quite different from those of Carantinos 1981 who - like Tsaklogou (1989) - used data from the 1974 Household Expenditure Survey. Carantinos's estimates on Theil's T index showed that the between-group inequality accounts for 30% of the overall inequality. Part of these differences could be attributed to the fact that Carantinos used grouped data on consumption expenditure. As Tsakloglou (1989) has pointed out, using a limited number of expenditure classes, Carantinos's estimates on within-group inequality were "downwards biased", since the extreme high and low incomes had only a marginal effect on the means of expenditure classes. This, of course, also resulted in the estimated contribution of the between-group inequality being analogously high.

As already noted, over the last decades, national and EU policies placed an emphasis in reducing inequality between different regions in Greece. Table 7.10 shows that, indeed, there are substantial differences in average household income between the regions of the country. The inequality between these regions varies significantly. The estimates of all indices suggest that the highest inequality appeared in the regions of "Epirus" and "Central and West Macedonia" while the lowest in "Greater Thessaloniki" and in "Greater Athens". These variations in inequality among the different regions are higher than the estimates provided by Tsakloglou (1988, 1989). This could be partly explained by the fact that Tsakloglou used household expenditure that usually appears more equally distributed than household income.

The decomposition analysis shows that only a small part of the overall inequality could be attributed to the inequality between regions. In particular, the relevant estimates, as far as the contribution of the between-group inequality to overall inequality is concerned, were 3.6% (T), 4.2% (L) and 1.7% ($C^2/2$). Therefore, more than 95% of the overall inequality is attributable to the inequality within these regions. The policy implication of these results is apparent. If the inequality between these regions were eliminated (as far as the average household income is concerned) but the inequality within each region remained the same, the overall inequality would not be reduced by more than 4.2%. Any policy not targeted at reducing income inequality within each region would only have a limited impact on reducing aggregate inequality.

Table 7.10: Decomposition of inequality by the region of household.

Region	$\frac{n_k}{n}$	μ_i	G	$A_{(\varepsilon=0.5)}$	$A_{(\varepsilon=2)}$	T	L	$C^2/2$
Greater Athens	0.369	751	0.317	0.083	0.316	0.176	0.174	0.227
East Mainland and Aegean Islands	0.115	626	0.389	0.125	0.486	0.258	0.279	0.318
West Mainland, Peloponnese and Ionean Islands	0.120	485	0.384	0.121	0.478	0.248	0.271	0.300
Greater Thessaloniki	0.087	572	0.256	0.053	0.217	0.105	0.113	0.109
Central and West Macedonia	0.089	646	0.485	0.215	0.545	0.590	0.425	2.105
East Macedonia and Thrace	0.059	595	0.402	0.137	0.422	0.312	0.284	0.523
Epirus	0.033	687	0.509	0.226	0.510	0.585	0.446	1.263
Thessaly	0.069	765	0.454	0.195	0.517	0.524	0.381	1.591
Crete	0.059	596	0.361	0.113	0.379	0.250	0.233	0.376
Total			0.377	0.124	0.431	0.286	0.259	0.593
Within-Group Inequality						0.275 (96.4)	0.248 (95.8)	0.583 (98.3)
Between-Group Inequality						0.010 (3.6)	0.011 (4.2)	0.010 (1.7)

(The contributions in percentages are in parenthesis)

These findings contradict the conventional belief of other researchers and policy-makers concerning the impact that income differences between regions have on the overall inequality in Greece (see Geronimakis 1970, Prodromidis 1975). The decomposition analysis by regions by Tsakloglou (1988), also stressed the small impact that the between-regions inequality has on aggregate inequality (see also Tsakloglou 1989). Despite that, his estimates for the contribution of between-regions

inequality were 11.3%-13.3% for 1974 and 8.6%-8.9% for 1982, which are considerably higher than the estimates of the present analysis. Apart from other factors that we have already mentioned, this could also be partly attributed to a narrowing of the inequalities between these regions that took place during the period between these surveys. This trend is also suggested by Tsakloglou's results. The narrowing of these differences could be seen as an effect of the structural changes in the Greek economy and as an effect of the relevant policies during this period.[12] Finally, the results of this decomposition analysis are more or less in line with what similar studies in other countries show. Jenkins' (1995) estimates showed that, during the period 1971 to 1986, the between region inequality in the United Kingdom did not account for more than 4% of the overall inequality.

The analysis in Section 7.3 has already emphasised the differences in average amount, as well as in the synthesis of income between households according to certain attributes of the head of household. Table 7.11 provides estimates on the differences in inequality between and within households according to the age of the head of household. Inequality was found to vary substantially according to the age of household head. The estimates of all indices show that the households the head of which falls within the age bracket "45-54" constitute the group with the highest income inequality. This is also the group with the highest average income. The lowest inequality was estimated in those households the head of which is up to age 24.

[12] This, of course, does not mean that the inequality within each region has also been reduced. This inequality may well have increased.

Table 7.11: Decomposition of inequality by the age of head of household.

Age of the head of household	$\frac{n_k}{n}$	μ_i	G	$A_{(\varepsilon=0.5)}$	$A_{(\varepsilon=2)}$	T	L	$C^2/2$
Under 25	0.035	668	0.272	0.065	0.309	0.125	0.145	0.129
25-34	0.142	713	0.327	0.091	0.412	0.185	0.204	0.219
35-44	0.194	701	0.355	0.105	0.361	0.228	0.219	0.326
45-54	0.224	720	0.425	0.168	0.490	0.440	0.333	1.319
55-64	0.206	644	0.374	0.122	0.456	0.271	0.258	0.439
65+	0.199	532	0.375	0.113	0.392	0.237	0.244	0.293
Total			0.377	0.124	0.431	0.286	0.259	0.593
Within-Group Inequality						0.280 (98.0)	0.253 (97.7)	0.587 (99.0)
Between-Group Inequality						0.006 (2.0)	0.006 (2.3)	0.006 (0.9)

(The contributions in percentages are in parenthesis)

The estimates of the indices used for the decomposition of inequality show that the within-group inequality accounted for more than 97.5% of the overall inequality. Therefore, even if the inequality on average household income between these groups were eliminated, the overall inequality would not be reduced by more than 2.5%. Tsakloglou (1988) also provides similar estimates for 1974 and 1982. The results of this analysis are also in line with Jenkins' (1995) estimates for the UK; his estimates showed that in 1986 the contribution of between-group inequality (according to the age of the head of household), accounted for not more than 4.5% of overall inequality in that country.

Differences in inequality were also found among the group of households according to the educational level of the head (Table 7.12). The estimates of all indices show that the highest inequality was observed in the group of households the head of which had no primary education. The lowest inequality was in the groups of households with the head in categories "non university higher education" and "upper cycle secondary education". Only the estimate of $A_{(\varepsilon=2)}$ index suggested that the group of households with the lower inequality was this in "university" category. This could provide us with additional information about the different way that incomes are distributed within these groups. As already noted, $A_{(\varepsilon=2)}$ is more sensitive to income differences at the bottom of the distribution.

Overall, the contribution of the between-group component to aggregate inequality in those groups that were formed according to the educational level of the head of household, was estimated to be 13.4%(T), 14.0% (L) and 7.3% ($C^2/2$). These were also the highest relevant estimates on the between-group component that have been found so far. This signifies the role of education in income differences. Despite that, the elimination of income differences between these household groups would only have a limited effect on reducing the aggregate inequality. In other words, a policy that would eliminate differences in the average incomes among education categories, but would leave the income inequality among the households in each group unchanged, would reduce the overall inequality by no more than 14%.[13] These results

[13] The relevant estimates provided by Tsakloglou (1988) are relatively larger. His estimates, concerning the between-group contribution, were 21.5-25.5% for 1974 and 17.4 -19.1% for 1982. He also found that the type of grouping and the number of categories also affect the between-group and within-group contributions. Lazaridis et al's (1989) estimates for 1982 on the within-group contribution to aggregate inequality in the groups formed according to educational level of the head of household

do not, of course, support certain versions of human capital theories that emphasise the role of education as the main determinant factor of personal income.

Table 7.12: Decomposition of inequality by educational level of head of household.

Education of the head of household	$\frac{n_k}{n}$	μ_i	G	$A_{(\varepsilon=0.5)}$	$A_{(\varepsilon=2)}$	T	L	$C^2/2$
University	0.082	1186	0.331	0.105	0.283	0.264	0.195	0.574
Non University Higher Education	0.049	856	0.293	0.077	0.313	0.165	0.161	0.235
Upper Cycle Sec. School	0.209	775	0.298	0.075	0.311	0.157	0.158	0.194
Lower Cycle Sec. School	0.088	624	0.332	0.093	0.372	0.192	0.200	0.236
Primary Education	0.390	560	0.367	0.117	0.391	0.268	0.240	0.491
Non Primary Education	0.182	472	0.399	0.153	0.466	0.416	0.301	1.792
Total			0.377	0.124	0.431	0.286	0.259	0.593
Within-Group Inequality						0.247 (86.4)	0.223 (86.0)	0.550 (92.7)
Between-Group Inequality						0.039 (13.6)	0.036 (14.0)	0.043 (7.3)

(The contributions in percentages are in parenthesis)

Finally, differences in inequality were also observed according to the occupational status of the head of household (Table 7.13). Among the households with an occupied head, the highest inequality was found in those households the head of which was a farmer. These are also the households with the lower average income. We can assume

were between 13-15%.

that the inequality is higher mainly because of the differences among the farmers in Greece, as far as the quantity and quality of the land they own is concerned. This, of course, could also be added to the explanations provided in reference to the findings that inequality in Greece is higher in rural than in urban or semi-urban areas (see analysis of Table 7.5). The lowest inequality among those households with occupied heads was found in the group of "craftsmen, labourers and service workers". The lowest inequality in all groups was found in the group of "students and unoccupied". This group consists mainly of students and few small rentiers (who were too few to form a separate group).

Thus the within-group inequality component also dominates the between-group component in the groups formed according to the occupational status of the head of household. Despite that, the contribution of the between-group inequality is the largest found, except for that between the educational categories. However, more than 89% of the aggregate inequality is found to be attributable to within-group inequality. Any attempt, therefore, to eliminate the between-group inequality, but leave the within-group inequality unchanged, would only reduce the overall inequality by no more than 10.6%.

Table 7.13: Decomposition of inequality by occupational status of head of household.

Occupational status of head of household	$\frac{n_k}{n}$	μ_i	G	$A_{(\varepsilon=0.5)}$	$A_{(\varepsilon=2)}$	T	L	$C^2/2$
In occupation								
I	0.101	1066	0.346	0.118	0.352	0.300	0.225	0.757
II	0.121	873	0.376	0.124	0.366	0.303	0.244	0.693
III	0.280	613	0.323	0.091	0.319	0.205	0.184	0.351
IV	0.193	527	0.428	0.157	0.532	0.356	0.339	0.639
Not in occupation								
V	0.235	570	0.343	0.096	0.355	0.199	0.208	0.240
VI	0.023	625	0.226	0.041	0.157	0.084	0.085	0.091
VII	0.047	539	0.355	0.104	0.456	0.204	0.242	0.213
Total			0.377	0.124	0.431	0.286	0.259	0.593
Within-Group Inequality						0.256 (89.5)	0.231 (89.4)	0.560 (94.4)
Between-Group Inequality						0.030 (10.5)	0.028 (10.6)	0.033 (5.6)

(The contributions in percentages are in parenthesis)
I : Professionals and Administrative Executives.
II : Clerical, Tradesmen and Salesmen.
III : Craftsmen, Labourers and Service Workers.
IV : Farmers
V : Retired
VI : Students and unoccupied
VII: Unemployed

7.6 Conclusions and Policy Implications

The aim of this chapter was to analyse inequality in Greece according to certain population characteristics. The analysis of inequality by population subgroup is often used by studies in the field as a valuable tool for understanding and explaining income differences between people. From a policy perspective, this is also crucial for

evaluating, as well as for formulating and implementing efficiently policy interventions related to inequality and poverty.

The first issue that this chapter investigated concerned the income differences between certain population subgroups. Those groups were formed according to particular general characteristics of the household such as size, composition and degree of urbanisation, and according to certain attributes of the head of household such as education, age and occupation. Emphasis was put not only on the average total household income, but also on the differences in the synthesis of household income as far the contribution of each individual source is concerned.

The analysis showed that the average household income is, indeed, affected significantly by certain characteristics of the unit of analysis. The analysis by income source showed that there are also disparities in the structure of household income between different subgroups. This analysis helped to shed more light on income differences, and provided additional valuable information on household characteristics and profile. This information often proved quite important in understanding and explaining certain differences between population subgroups. Therefore, policy makers could be greatly helped in identifying priorities and in designing and implementing interventions.

The above analysis does not, of course, say anything on how the income is distributed within these population subgroups. From a policy perspective, it is crucial to know the extent to which the overall inequality is attributable to inequality between these

subgroups and the extent to which it is attributable to inequality within them. In order to investigate this issue, inequality was decomposed into within-group and between-group components. A number of alternative indices were used in order to capture the different aspects of the inequality and to serve as a test for the robustness of the estimates in the decomposition exercise.

Income inequality was found to vary significantly among different population subgroups. Additionally, the decomposition analysis showed that in all groups used, the between-group inequality accounts only for a very small part of the overall inequality. Reducing inequality between the household groups would have only limited effect on reducing the overall inequality. In particular, the analysis according to the degree of urbanisation showed that no more than 5.3% of the overall inequality is attributable to the between-group component. The relevant figure for the inequality between regions is 4.2%. This estimate is even lower for the group formed according to the age of the head of household. By contrast, the highest estimate on the between-group component, with 7.3-13.4%, were found in those groups formed according to the educational level of the head of household. Household groups that were formed based on the occupational status of the head of household also showed a relatively high contribution of the between-group components to overall inequality. Still, of course, any attempt to eliminate the between-group inequality, but leave the within-group inequality unchanged, would not have any significant effect on the aggregate inequality. The policy implications of these findings are apparent. A policy that is not targeted at reducing inequality within each of the above household groups would only have a limited impact on reducing overall inequality.

CHAPTER EIGHT

FAMILY BACKGROUND AND POVERTY IN GREECE

8.1 Introduction

The aim of this chapter is to introduce a more dynamic approach than the one usually adopted for analysing inequality in Greece, by examining the relationship between family background and household economic status. Results may delineate novel areas for policy interventions in fighting poverty, and, generally, social and economic inequality in Greece. The hypothesis put forward is that the family background, and in particular the parents' socio-economic status, is a significant factor in determining the offspring's opportunities for training and accessing the labour market and, generally, their future socioeconomic status. The socio-economic status of the parents is thus hypothesised to be linked with the possibility of their children falling below or above the poverty line. Within this hypothesis, education is considered as a crucial vehicle transferring a specific economic status to the next generation.

In the last thirty years, and under the influence of conventional economics, researchers have tended to neglect the influence of the socio-economic status of the family of origin on the unit of analysis (household, individual etc). Instead, they have

focused their studies mostly on the relation between poverty - or generally inequality- and the social and demographic characteristics of this unit. From the dominant perspective of conventional economics, each individual's current economic status depends on his/her personal choices and abilities through a utility maximisation process. The equality of opportunities and the individual's knowledge of all possible alternatives are considered as given facts. No obstacles are generally recognised in obtaining the necessary training and in gaining access to jobs, education and welfare provisions. It is taken for granted that potential talents, implicit in their genetic endowments, can be turned into capabilities through training (Taubman 1978). According to this conceptualisation, earnings are largely determined by the nature of personal choices, the latter being influenced by the level of individual intelligence.

It appears from the above that two different approaches have emerged for understanding and accounting for inequality and poverty. The impact is evident on the planning of social policies. Although this difference in view touches upon a number of vital issues, education and some inter-related topics seem to be of particular importance within this difference.

From the stance of Human Capital Theory and the focus on related "earning functions", poverty is associated with low productivity on the part of the poor, a result of their inadequate education and training (Mincer 1958, Becker 1964). Economic factors, such as the difference between the cost of an additional unit of education and the expected rewards from it, are proposed as explanations of evident variations in school attendance and quality. Due to the dominance of this standpoint, the fight against poverty in many European countries and the USA has been more or less

exhausted in efforts to bring educational reforms, such as the introduction of compulsory and compensatory education and the removal of certain barriers that were taken to be responsible for the lack of equal opportunities in training and education.

The recent increase in inequality in developed countries re-opened the long-standing debate concerning intelligence and the use of IQ measurements. Proponents of the one approach consider the performance in IQ tests as the key factor in determining inequality and poverty. Intelligence is viewed as an independent genetic factor that is not affected by the socio-economic environment of the individual in any significant way. The parental level of education is not seen as related to the educational opportunities available to their offspring. Moreover, because of the reported intergenerational immobility and the relevant stability of IQ scores across the life span - even after the application of specific educational methods - advocates of this approach support that public spending on educational policies, and, particularly, on compulsory and compensatory education, is totally unjustified (Jensen 1969, Herrnstein 1971, Herrnstein and Murray 1994). However, a number of other theorists have criticised this view, presenting arguments against the biological basis of intelligence and challenging the link between high IQ scores and intelligence (Atkinson 1983, Bowles 1972, 1973, Bowles and Gintis 1973, Bowles and Nelson 1974).[1] Empirical studies have also shown a strong influence of family background on child abilities (Bowles 1972, Corcoran et al 1976).[2] Recently, as a response to

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[1] Prominent psychologists, such as Gardner (1991) have argued that tests of intelligence serve as traps for students, educators, as well as theorists, who, especially in the United States, overly emphasise the technocratic aspects of education. Gardner (1983) and Sternberg (1985) have each proposed well received theories of human intelligence that go beyond IQ in the way it is traditionally conceptualised and assessed.

[2] Drawing again from psychological theory and research, Bereiter (1985) has shown that the educationally disadvantaged are usually defined in terms of demographic and educational variables. The impact of interpersonal experiences tends to be ignored, probably because it cannot be readily

Herrnstein and Murray (1994), a number of studies have contributed to this debate by challenging the validity of the authors' arguments from different theoretical and methodological angles, as well as by bringing out the failures of their empirical analysis (Fraser 1995, Hauser and Carter 1995, Goldberger and Manski 1995, Fischer et al 1996).

It is worth, of course, mentioning that during that period a number of studies attempted to investigate the intergenerational transmission of inequality and look at the issue of intergenerational consequences of family background as an important item on the research agenda (Meade 1973, Bowles 1972, Bowles and Nelson 1974, Morgenstern 1973, Brittain 1977, Broom et al 1980, Coffield 1981, Atkinson et al 1983, Goldthorpe 1987, Papatheodorou and Piachaud 1998).[3]

Equality of opportunity has been called into question as far as race, ethnic and gender discrimination are concerned, and in some countries this has led to the introduction of affirmative action policies. As a rule, however, the role of family background has not

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abstracted and measured. Research has shown that effective schools are determined less by students and their aptitudes and more by parental and teacher support, involvement and the transmission of high expectations (see Ascher 1988, Brookover 1985, Comer 1988, Damon 1990).

[3] The majority of these studies give emphasis to the indirect influence the family background has on earnings through the effect on one's education (Corcoran et al 1976, Psacharopoulos 1977, Bowles 1972, Morgenstern 1973, Manski 1992). Due to lack of sufficient longitudinal data, many of the studies used certain parental characteristics and, in particular, father's education and occupational status as a proxy for the background and the income of the family of origin (Bowles 1972, Psacharopoulos 1977, Treiman and Hauser 1977, Papanicolaou and Psacharopoulos 1979, Papatheodorou 1997). On the other hand, some of the studies used more detailed information on family background based either on follow-up studies (Atkinson et al 1978, 1983) or on longitudinal data (de Wolff and van Slijpe 1973, Gustafsson 1981, Solon et al 1991, Peters 1992). Similarly, sociological research into social, occupational and educational mobility, based on class analysis, puts emphasis on how the parental socio-professional status could explain their offspring's status (Goldthorpe 1987, Halsey et al 1980). A number of studies has also looked into intergenerational consequences of certain familial patterns such as family disruption, single parenthood (see McLanaham 1985, 1988, McLanaham and Bumpass 1988). A number of psychological studies have linked low IQ scores with poverty, poor schools, inadequate health care and other environmental factors (see Humphreys and Darey 1988, Wachs and Gruen 1982, Weinberg 1989).

been a priority on the research agenda. Fortunately, the issue of equal opportunities has recently obtained a status of priority, especially within EU social policy interventions, due to the interest attracted by debates on social exclusion and marginalisation. The time is, therefore, right for shedding more light on the relationship of family background to equality of opportunities, especially in connection to inequality and poverty.

It has to be noted that people with socially and economically privileged parents usually earn more than people with less privileged parents. As Corcoran et al. (1976) wrote, "*there is no reason to suppose that men with privileged parents have a stronger preference for cash, as against psychic income, from their work. If anything, the contrary seems likely*" (p. 430). Meade (1973) argues that even in a fully competitive, *laissez-faire* society with unrestricted mobility, personal income may continue to be unequal because citizens are not equally endowed. "*A citizen in a laissez-faire competitive society would receive certain endowments from his parents which could help to determine the amount of income which he could earn and property he could accumulate during his own lifetime. This in turn would affect the endowments which he could hand on to his children*" (Meade 1973, p. 4). Among those endowments that a person inherits, Meade recognises property, the level of education and training (years of schooling, quality of schools etc), as well as the "social contacts" he makes with other persons who are "*...affected by the social background into which he was born*" (Meade 1973, p. 5). As also pointed out by George (1980b), when criticising the basic arguments of the "functional theories" on inequality, "*family background is important to both* [social differentiation, (i.e. social inequality in any generation) and social stratification (i.e. social inequality from

generation to generation)] *but crucial to the second. It is totally unrealistic to maintain that people do not use the privileges and wealth which they may possess in order to further their own and their descendants' position. Such an implicit assertion flies in the face of everyday reality"* (p. 6).

It is not suggested here that the importance of personal characteristics is trivial in determining one's economic status. What is emphasised is the need for a more dynamic approach in tackling the issue of inequality and poverty. In practice, this means the broadening of our frame of reference to account for factors that may have a direct or indirect influence on what appears to be personal attributes.

8.2 Methodological Issues

This chapter examines the relation between the educational and occupational status of the family of origin and the probability of falling above or below the poverty line. Having formed certain assumptions, the critical level of income in order to define the poverty line was taken to be the half of the average equivalent household income. The poverty line is defined by the use of household disposable equivalent income. The choice of poverty instead of income as the variable of interest is based on the hypothesis that family background does not strictly affect income, but rather it affects one's opportunity to choose between activities with different monetary and non-monetary rewards. Bowles (1972) has pointed out that *"the income received by an individual is thus the result of a choice - a choice constrained by what could be called the occupational opportunity set [...]. There is considerable evidence that rich, high-*

status parents place a larger value on the non monetary aspects of work and a lower value on monetary returns than poorer, lower status parents" (p. S238). Thus poverty could be a sharper indicator of the influence that family background has on personal choices than income, which might show higher mobility. To illustrate this point further, one could easily imagine the offspring of a wealthy family choosing the academic field instead of the managerial (or industrial), even though the former would normally offer less monetary awards. The same person, however, would not intentionally fall bellow a certain consumption level that would place him/her among the poor.

In beginning to think about methodology, the difficulties encountered were in regard to two questions: first, how to define parental background using empirical data and, second, how to select those parental characteristics that are most representative of parental status and may at the same time affect children's future economic status. The scarcity of available statistics partly simplified this task (see Chapter 4). For the purpose of this study, analysis was confined to the use of father's education and occupation.[4] The critique may be that family background includes a variety of other factors that may play a significant role in children's future economic status. It is, undoubtedly, true that these parental characteristics are only a proxy of the economic status of the family. Unfortunately, even if information on the income of both parents

[4] Papatheodorou and Piachaud (1998) also investigated the influence of the mother's educational level. Mother's education was found to have an influence, similar to father's education, on children's education and poverty. Furthermore, mother's education appeared to be strongly associated with father's attributes and in particular, education. Therefore, when the mother of the respondent was better-educated it was highly probable that the father was better-educated too. Given this, the result represents the cumulative effect on respondent's attributes of both parents being better-educated. Similarly, when the father was little-educated it was almost certain that the mother was also little-educated and thus the result represents the cumulative effect of both parents being little-educated. Therefore, in order to simplify the analysis, we chose not to use the mother's education, since it does not affect the aims of this study in any significant way.

were available, assessing their economic status would be impossible, since there are no reliable distribution statistics for Greece before the 1970s.[5]

Similar difficulties were encountered in choosing the key characteristics of the head of household (where household is the unit of analysis) which may be affected by the parental background, and in accounting for the influence of other household members' features. Given the restrictions imposed by the lack of sufficient data, the choice of educational level of the head of household as a key personal characteristic in examining the influence of family background is in line with the aim of this analysis. We should note that the aim is to examine the causal relationships between specific parental and respondent's attributes and to investigate their association and interaction. This present study does not hope to paint the complete picture of the influence of family background on individual status.

In this analysis only the male-headed households have been used. According to the definition adopted in the 1988 survey, the man was considered to be the head of household in the case of both married and cohabiting heterosexual couples, except when he was seriously incapacitated. In all other cases, the family members named the head of household. As a result of this definition, only 493 household were monitored as headed by women. As noted in Chapter 7, these women were often widowed, divorced, single or wives of emigrants and seamen. In this present analysis, these latter households have been excluded. Excluded have also been 20 more households because of missing or insufficient information on some of the key

[5] The lack of longitudinal data and panel surveys in Greece have put serious limitations on analysing the influence of parental characteristics on their children's status, and is common to all the studies in the area (Kassimati 1980, Karageorgas et al 1990, Psacharopoulos and Kazamias 1985,

variables on family background, such as the occupation and education of the father of the head of household. Thus the total number of cases used in this analysis is 2,427. In trying to assess the socio-economic status of the family of origin, we sought information on the longest-practised job (occupation) and educational level of the father of the head of household.[6]

8.3 Family Background, Education and Poverty

In order to investigate the relationship among the particular characteristics of the family of origin and the characteristics of the family of the respondent we first conducted some basic cross-tabulations. Table 8.1 shows the association between the education of the head of household and poverty. At a first glance, the strong relationship between educational level of heads of household with the poverty rates is apparent. When the head of household had "no primary" education the poverty rates were considerably higher than for those with "primary" education; poverty rates fell dramatically for those with "secondary" and "higher" education. Another way to look at these differences is by calculating the relative odds-ratio. Thus the households with the head in the category "no primary" education are 22.4 times more likely to fall below the poverty line than those households the head of which is in the category "college". Also, these households are 8.4 times more likely to fall below the poverty

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Tsakloglou 1990).

[6] The response on father's occupation as the longest practised job may be misleading for the purpose of this study. The longest-practised occupation is not necessarily the occupation that the father had during a particular period of the respondent's life, i.e. when the respondent was young, which might be considered a better indicator of the influence that the father's status had.

line than those households the head of which is in the category "secondary" education. [7]

Table 8.1: Poverty by educational level of the head of household.

	Educational Level of the Head of Household				
	No Primary Education	**Primary Education**	**Secondary Education**	**Higher Education (College)**	**Total**
Poor (%)	41.4	28.5	7.7	3.1	23.0
Not Poor (%)	58.6	71.5	92.3	96.9	77.0
TOTAL	100.0	100.0	100.0	100.0	100.0
(N)	(379)	(1242)	(479)	(327)	(2427)

$\chi^2 = 230.482$ DF 3 Significance 0.0000

The above results are what one would anticipate, despite the sharp differences in poverty rates among educational categories. They indicate the strong association between poverty rates and educational level of the head of household.

When the relationship between poverty rates according to the educational level and occupational status of the father of the head of household is examined, a similar picture appears. Poverty rates are clearly associated with the educational and

[7] It is clear that the more educational categories we use the more detailed information we obtain on the differences in poverty rates. Thus, as reported in Chapter 7, as well as in Papatheodorou (1992), as far as the household income is concerned, there are substantial differences between "lower" and "upper cycle of secondary education" and the "university" and "non university higher education" categories. Despite this drawback, the shortening of educational categories is considered necessary when the sample is not big enough and we wish to avoid a very small number of observations in particular

occupational level of the father of the respondent. In Table 8.2 the association between father's educational level and respondent's poverty rates is presented.

Table 8.2: Poverty by educational level of the father of the head of household.

	Educational Level of the Father of the Head of Household				
	No Primary Education	**Primary Education**	**Secondary Education**	**Higher Education (College)**	**Total**
Poor (%)	30.2	18.6	9.7	1.3	23.0
Not Poor (%)	69.8	81.4	90.3	98.7	77.0
TOTAL	100.0	100.0	100.0	100.0	100.0
(N)	(1130)	(1094)	(124)	(79)	(2427)

$\chi^2 = 78.089$ DF: 3 Significance 0.0000

Father's educational level appears to affect poverty rates in the same way that the education of the respondent does, though not so sharply. The category "no primary" education had the higher poverty rates and contained 61% of the total number of households below the poverty line. The poverty rates among the households with the father of the respondent in "no primary" education was 30.2 %, while the relevant figure for those with a father in "higher" education was only 1.3%. Thus the household with the father of the respondent in category "no primary" education is 33.7 times more likely to be poor than the household with the father in category

subcategories (according to the type of tabulation).

"higher" education and 4 times more likely than the father in category "secondary" education. Or, it is 0.03 times less likely for a household to become poor when the father of the head of household has a "higher" education than a "no primary education".

Similarly, the occupation of the father of the respondent has a clear influence on poverty rates of the household of the respondent. In Table 8.3 we classify father's occupation into three categories:[8]

Category I : Professionals, Administrative Executives, Clerical, Tradesmen and Salesmen

Category II: Craftsmen, Labourers, Service Workers

Category III: Farmers.

There is an obvious association between poverty rates and father's occupation. The highest poverty rates appeared when the father of the respondent was a farmer (category III) and the lowest in category I. Therefore, 72.8% of the fathers of heads of all households below the poverty line were "farmers". Households with the father of

[8] At a first glance, this classification of occupations, especially category I, may be seen as insufficient, so that further refinement of these categories might be suggested. Clearly, under the restrictions imposed by the available statistical data, the more occupational categories we use the more detailed information we can obtain. Papatheodorou and Piachaud (1998), using the same micro-data, separated "clerical, tradesmen and salesmen" from "professionals and administrative executives" in order to refine the occupational categories. On the one hand, it appeared that the performance of "clerical, tradesmen and salesmen" - as far as the influence of father's occupation to respondent's poverty and education is concerned - was more similar to that of the category of "professionals and administrative executives" than any other occupational category. One explanation for this is that the category of "professionals and administrative executives" is not very homogeneous and incorporates occupations with very different monetary rewards and skills, although they are classified in the same group. On the other hand, these occupational categories contained the smallest number of cases, which makes further sub-division rather problematic. Therefore, in order to avoid a considerably small number of observations or empty cells in particular sub-categories, this shortening of the occupational categories was decided, since it did not violate the main aims of the study. The classification of the father's occupation in these categories is based on the methodology and definitions followed by Panagiotopoulou (forthcoming), who also used the same micro-data.

the head in category III are 4.2 times more likely to be poor than households with the father in category I and 1.9 times more likely to be poor than households with the father in category II. In other words, a household is 0.24 times less likely to fall below the poverty line when the father of the head is in occupational category I than in occupational category III.

Table 8.3: Poverty by occupation of the father of the head of household.

	Occupation of the Father of the Respondent			
	I	**II**	**III**	**TOTAL**
Poor (%)	9.0	18.0	29.3	23.0
Not Poor (%)	91.0	82.0	70.7	77.0
TOTAL	100.0	100.0	100.0	100.0
(N)	(389)	(651)	(1387)	(2427)

$\chi^2 = 83.187$ DF 2 Significance 0.0000

I : Professionals, Administrative Executives, Clerical, Tradesmen and Salesmen.
II : Craftsmen, Labourers, Service Workers
III : Farmers

The above cross-tabulations suggest a clear association between parental characteristics and the probability of one household falling below or above the poverty line. Why should that be the case? Undoubtedly, the educational level and occupational status of the father affect the educational level of his children. Indeed, the educational level of the father, as presented in Table 8.4, is significantly related to the educational level of the head of household. The value of Gamma is 0.649, which

denotes a rather strong positive association between them. Thus the education of the father remains a strong determinant factor of the child's education.

Table 8.4: Households by educational level of the heads of household and the educational level of their fathers.

	Educational Level of the Father of the Respondent				
Educational level of the respondent	**No Primary Education**	**Primary Education**	**Secondary Education**	**Higher Education (College)**	**Total**
No Primary Education (%)	27.3	6.5	0.0	0.0	15.6
Primary Education (%)	57.7	51.2	17.7	10.1	51.2
Secondary Education (%)	10.6	26.0	39.5	32.9	19.7
Higher Education (%)	4.4	16.4	42.7	57.0	13.5
TOTAL	100.0	100.0	100.0	100.0	100.0
(N)	(1130)	(1094)	(124)	(79)	(2427)

$\chi^2 = 616.359$ DF 9 Significance 0.0000

Gamma = 0.64902

Intergenerational mobility is apparent, however, in education. Two - non-mutually exclusive - explanations may be suggested for this type of mobility. One is that, since the Second World War, the rapid changes that took place in the structure of the Greek economy had a great impact on the division of labour and the nature of socio-economic activities (Karageorgas et al 1990). This, in turn, created mobility in

education, since changes in the occupational structure demanded educational adjustments to the new needs that emerged. Another explanation is that educational reforms and the introduction of compulsory education improved the population's educational level (Kassimati 1980).

It seems that under conditions related to modifications in Greek socio-economic activities, upward social mobility became an important issue for Greek families. Investing on the education of their children was, therefore, given high priority (Tsoukalas 1986a, Tsoukalas and Panagiotopoulou 1992).[9] Despite that, family background seems to put barriers on educational mobility. The majority (57%) of the respondents whose fathers had "no primary" education moved into the next educational category (primary). This might be seen as the result of introducing compulsory education up to this level. Only 4.4% managed to get a university degree, while 27.3% were with "no primary" education. By contrast, none of the respondents whose fathers are found in the educational categories "secondary" and "university" appear with "no primary" education, while the majority appear to be in the "higher" education category themselves. In our view, this clearly illustrates that people face unequal opportunities in education because of their families' background.

In addition, as Table 8.5 shows, the sons' educational level is significantly related with their fathers' occupation. The majority of the households with the respondent's father in the category "farmer" had only "primary" education; overall 80.6% of them

[9] Petmesidou-Tsoulouvi (1987) argues that middle classes families in Greece, despite the efforts invested in their children's education, doubt the existence of meritocracy in relation to the efficacy of education alone for achieving social and economic success. On the contrary, they tend to put more emphasis on access to the centres of power. Therefore, although they recognise the value of education as a social status, they tend instead to consider educational degrees as a poor substitute for the economic and social capital they do not have.

remained in the category "up to primary" and only 7.0% of them manage to be in the "higher" educational category. By contrast, 32.6% of the respondents with the father in occupational category I (administrative executives, professionals, traders, clerical etc) appear to be in the "higher" educational category.[10]

Table 8.5: Households by respondent's father occupation and respondent's educational level.

	Occupation of the Father of the Respondent			
Educational Level of Respondent	**I**	**II**	**III**	**TOTAL**
No Primary Education (%)	4.6	10.1	21.3	15.6
Primary Education (%)	31.1	45.9	59.3	51.2
Secondary Education (%)	31.6	28.1	12.5	19.7
Higher Education (%)	32.6	15.8	7.0	13.5
TOTAL	100.0	100.0	100.0	100.0
(N)	(389)	(651)	(1387)	(2427)

$\chi^2 = 362.905$ DF 6 Significance 0.0000

I: Professionals Adm. Executives, Clerical, Tradesmen and Salesmen.

II: Craftsmen, Labourers, Service Workers

III: Farmers

Clearly then, our evidence does not support pure versions of the "human capital" hypothesis of equality of opportunities. There are differences in patterns of continuing

[10] In addition, a number of studies have also shown the unequal probabilities of access to the university education that people face in Greece, because of their family background (Psacharopoulos and Kazamias 1985, Fragoudaki 1985, Chrysakis 1991, 1996). Furthermore, as Chrysakis argued, during the period 1978 to 1988, these inequalities of access increased significantly, especially as far as the influence of the father's education is concerned (Chrysakis 1991, 1996).

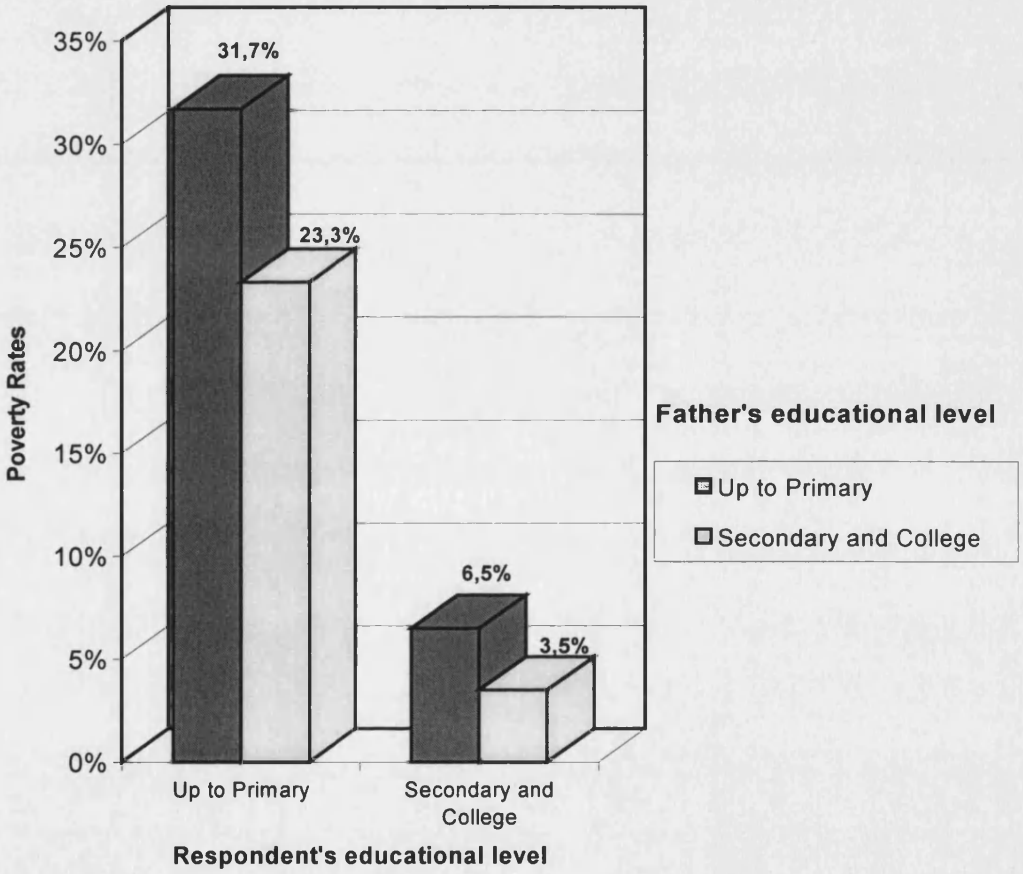
education among individuals that are clearly related to their parental status. As Piachaud (1975) argues, "*economists have, under the influence of the "human capital" school, tended to look at problems in terms of narrowly defined rates of return and paid too little attention to the actual circumstances of individuals and families and the choices, often all too limited, facing them. Yet, until the economic barriers to equal opportunity are understood and removed there can be little prospect of reducing educational inequality*" (p. 212).

Could the influence of father's education and occupation on the respondent's educational level explain the association between those parental characteristics and poverty rates? Do these parental attributes have any other direct effects on the household's risk of poverty?

In Figure 8.1 poverty rates according to the educational level of heads of household and their fathers are presented. To map this out in a simple way, we use only two educational categories "up to primary" education and "secondary and college" education. As can be seen, poverty rates among households the heads of which (respondents) have the same educational level vary according to the educational level of respondents' fathers. Thus among households in which the education of the respondent was "up to primary", those with fathers in "up to primary" educational level have higher poverty rates than those with fathers in the "secondary and university" category. In other words, the households with the respondent in "up to primary" category are 1.6 times more likely to be below the poverty line when their father is at "up to primary" level in comparison with those with a father at "secondary and university" level. Among those with the respondent at "secondary and university"

level, those with the father in the category "up to primary" are twice as likely to fall below the poverty line than those with the father at "secondary and university" level are.

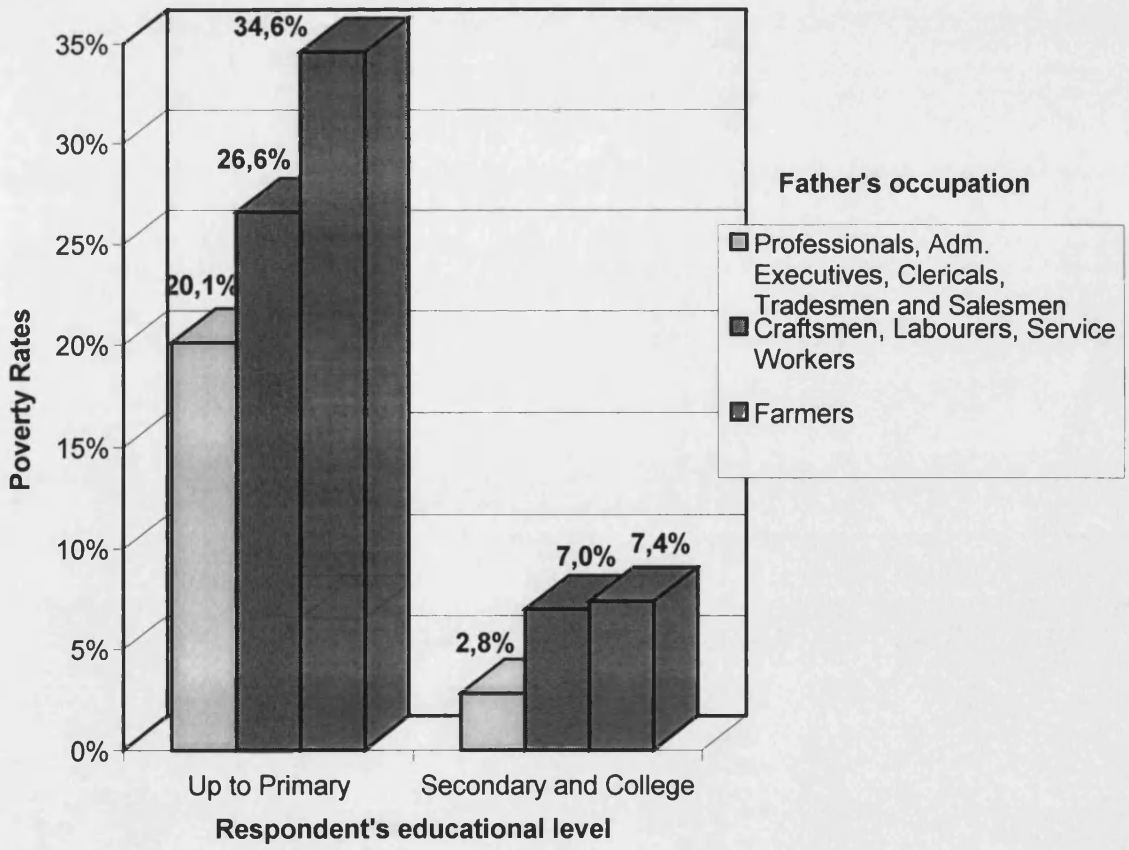
Figure 8.1: Households in poverty according to respondent's and father's educational level.



Similarly, as it is illustrated in Figure 8.2, poverty rates among households the heads of which share the same educational level vary considerably according to the occupational status of their fathers. Indeed, the households with the respondent's education at the level "up to primary" are 2.1 times more likely to be poor when the

occupation of their father is in category III ("farmers") than in category I. The differences are sharper among households with respondents' educational level being "secondary and college". Those with a father in category "farmer" are 2.8 times more likely to fall below the poverty line than those with a father in category I. In other words, among the households in which the education of the respondent was in "secondary and college" category, those with a father in occupational category I were 0.36 times less likely to be poor than those with a father in category III.

Figure 8.2: Households in poverty according to father's occupation and respondent's educational level.



The above results suggest that father's occupation and educational levels affect the probability of a household falling below the poverty line, not only indirectly, through the influence on respondent's educational level, but also directly.

8.4 A Model of the Effect of Family Background

So far we examined the relationships between poverty and particular characteristics of the family of origin's background and the head of household. It is obvious that, although we restricted our analysis to these attributes, we have investigated only a number of the possible associations and interactions among them. A lot of the potential complex relationships among these variables have not been investigated. Thus we found that for a given level of education of the respondent, the probability of being in poverty depends on his father's education. Does this indicate a causal connection? Could the father's educational level affect poverty rates through the effect on father's occupational status or the other way round? Do these attributes interact? In order to uncover the potentially complex relationships among those variables, given that all are categorical, we now make use of loglinear analysis.[11]

We consider a four-way contingency table formed by the following variables:

- Poverty (P) - coded 1 if household is below the poverty line and 2 if household is above the poverty line (i=1,2).
- Respondent's education (E) - classified in two categories, 1 "up to primary" education and 2 "secondary education and university" (j=1,2)

[11] See Agresti (1990), Kennedy (1992), Gilbert (1993).

- Father's education (S) - the same categories as respondent education (k=1,2)
- Fathers occupation (O) - we distinguish 3 categories 1: professionals, administrative executives, clerical, tradesmen and salesmen, 2: craftsmen, labourers, service workers, and 3: farmers (l=1,2,3).

The expected frequencies m_{ijkl} in each cell could be expressed with the following loglinear equation:

$$\log m_{ijkl} = \mu + \lambda_i^P + \lambda_j^E + \lambda_k^S + \lambda_l^O + \lambda_{ij}^{PE} + \lambda_{ik}^{PS} + \lambda_{il}^{PO} + \lambda_{jk}^{ES} + \lambda_{jl}^{EO} + \lambda_{kl}^{SO} + \lambda_{ijk}^{PES} + \lambda_{ijl}^{PEO} + \lambda_{jkl}^{ESO} + \lambda_{ikl}^{PSO} + \lambda_{ijkl}^{PESO}$$

where μ is the grand mean, λ_i^P the effect of attribute i of the characteristic P and λ_{ij}^{PE} the joint effect of i and j attributes of the characteristics P and E.

We follow a notation used for hierarchical models, which contains all the lower-order relatives. Thus for the above saturated model the notation will be [PESO]. Our purpose is to find a suitable and parsimonious loglinear model that would provide a good fit of the data.[12] The test of the hypothesis that a particular model fits the observed data is based on the log likelihood ratio statistic (G^2) which has an asymptotic chi-square distribution (Argesti 1990).[13] The first step in our analysis is to test the hypothesis of the absence of the Kth and higher order interaction terms. Table 8.6 gives the estimated significance level that Kth and higher order effects are 0. The observed significance level for the test that third and higher order terms are 0 is

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[12] SPSS Model Selection Loglinear Analysis is used (Norusis 1994).

[13] $G^2 = 2\sum_i \sum_j \sum_k \sum_l f_{ijkl} \log(\frac{f_{ijkl}}{m_{ijkl}})$

where f_{ijkl} the data cell frequencies, m_{ijkl} the estimated (model) cell frequencies and **log** is the natural logarithm.

large (0.4222) and thus the hypothesis that third and fourth order interactions are 0 should not be rejected.

Table 8.6: Test that all k-way and higher interactions are zero.

K	DF	G^2	Prob.	Interaction
4	2	3.350	.1873	3
3	9	9.165	.4222	5
2	18	1070.231	.0000	2
1	23	4708.225	.0000	0

The results of Table 8.6 show that an adequate model representing the data would include no higher than 2-order interaction terms. This, however, does not mean that all 2-order effects are present. Thus the next step is to test the individual terms. In order to do this the "partial chi-square" is used.[14] Table 8.7 shows the importance of the various interaction terms, testing the partial association for the various orders less than or equal to 2.

The examination of this table suggests that the only association than could be excluded is the [PS]. The best fitting model is the [PE] [PO] [SO] [ES] [EO], which

[14] The "partial chi-square" is the difference between the two likelihood ratio statistics for the model with and without the effect that is tested. The partial chi-square has also a chi-square distribution

includes all the two-pair associations and the lower order relatives except the association [SP]. Thus the selected model that fits the data is the following:

$$\log m_{ijkl} = \mu + \lambda_i^P + \lambda_j^E + \lambda_k^S + \lambda_l^O + \lambda_{ij}^{PE} + \lambda_{il}^{PO} + \lambda_{jk}^{ES} + \lambda_{jl}^{EO} + \lambda_{kl}^{SO}$$

The model fits very well with a $G^2 = 9.526336$ at 0.483 significance level.[15]

Table 8.7: Partial chi-squares.

Effect	DF	Partial Chi-squares	Prob.	Interaction
P*S	1	.362	.5475	5
P*E	1	159.046	.0000	5
S*E	1	103.020	.0000	5
P*O	2	20.295	.0000	5
S*O	2	219.239	.0000	5
E*O	2	134.472	.0000	4
P	1	747.396	.0000	2
S	1	1968.641	.0000	2
E	1	279.072	.0000	2
O	2	642.885	.0000	2

(Norusis 1994).

[15] Another way to select the best fitting model is by backward elimination or forward selection. In Appendix III, the model selection using backward elimination is presented.

Table 8.8: Parameter estimates for the loglinear model.

Lambda Parameter	Estimate	SE	Z-Value	Asymptotic 95%	
				Lower	Upper
Constant (Grand mean)	2.5159	0.2327	10.81	2.06	2.97
E=1	-0.9149	0.2230	-4.10	-1.35	-0.48
S=1	2.9493	0.2360	12.50	2.49	3.41
O=1	2.2821	0.2423	9.42	1.81	2.76
O=2	0.9432	0.2745	3.44	0.41	1.48
P=1	-2.4570	0.1636	-15.02	-2.78	-2.14
(E=1)*(S=1)	2.0392	0.2159	9.45	1.62	2.46
(E=1)*(O=1)	-1.3055	0.1419	-9.20	-1.58	-1.03
(E=1)*(O=2)	-1.0335	0.1096	-9.43	-1.25	-0.82
(P=1)*(E=1)	1.8132	0.1638	11.07	1.49	2.13
(S=1)*(O=1)	-2.9622	0.2528	-11.72	-3.46	-2.47
(S=1)*(O=2)	-0.9380	0.2811	-3.34	-1.49	-0.39
(P=1)*(O=1)	-0.8270	0.1962	-4.21	-1.21	-.44
(P=1)*(O=2)	-0.3261	0.1236	-2.64	-0.57	-0.08

In Table 8.8 the estimates for the lambda parameters are presented. All the estimated coefficients have a value of $|Z|$ which exceeds 1.96 and thus they can be considered significantly different from zero at the 0.05 level. The lambda parameters are simply the logarithms of the odds for the main effects and the odds-ratio for the interactions for the estimated frequencies.[16]

According to this model, all the two way associations are significant except the one between Poverty and Father's Education [PS]. Each of the above associations is conditionally dependent, given the other two variables. The above associations are interpreted diagrammatically in Figure 3.

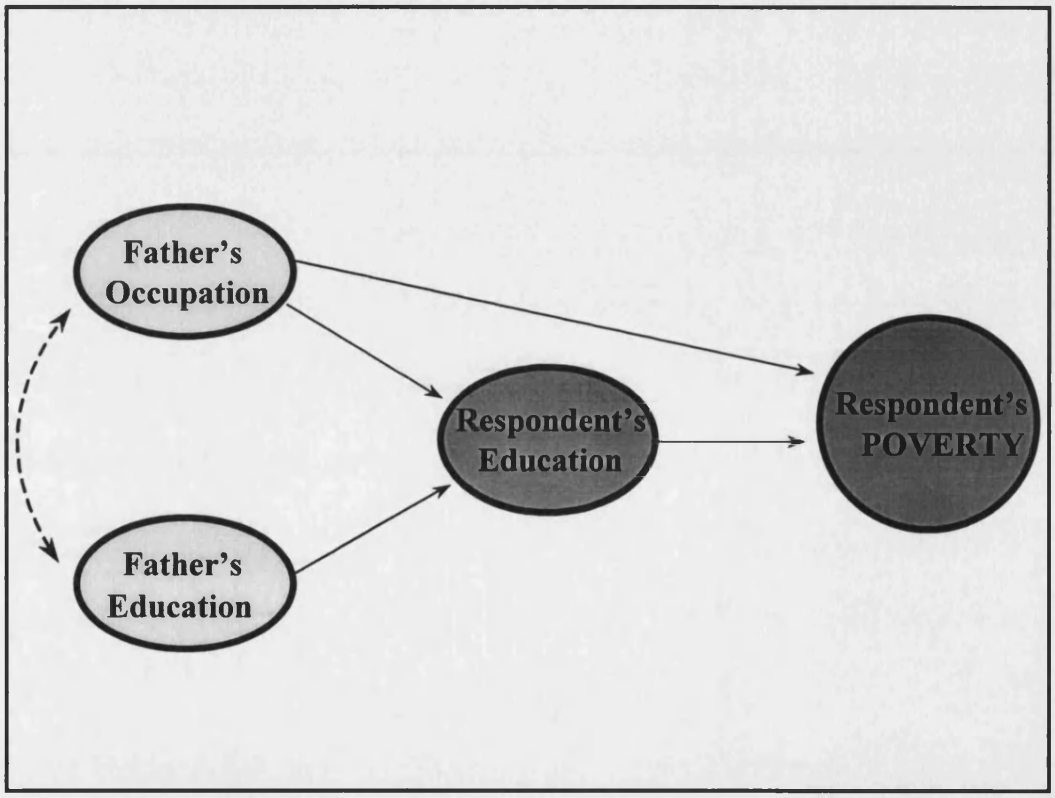
As one would anticipate, the education of the respondent has a strong direct effect on the probability of the household being below the poverty line independently of his father's education and occupation.[17] The $\lambda_{11}^{EP} = 1.8132$ shows that a household is more likely to be poor when the respondent's education is "up to primary" than when it is "secondary and college" education. This lambda parameter corresponds to an odds-ratio of 6.13, which means that the odds of a household being below the poverty line

[16] The lambda parameters have been estimated using SPSS: General Loglinear Analysis. In order to give a frame of reference, this procedure estimated the lambda parameters setting some of the lambda parameters to 0. In the above estimates all the effects involving the last category are set to 0. Therefore, the parameters for P=2, S=2, E=2 and O=3 are set to 0. Thus the parameter estimate for P=1 uses the P=2 as a frame of reference and so on. Since the lambda parameters are the log of the odds or the odds-ratio (see footnote 18), we can easily estimate from the figures provided in Table 8.8 all the other lambda parameters with different points of references.

[17] We do not discuss the main effects because they have already been presented in the cross-tabulation. Thus the $\lambda_1^P = -2.457$ shows that a household, with a respondent in "secondary and college" educational category and the respondent's father a farmer and in "secondary and college" educational category too, is more likely not to be poor than to be poor.

with the respondent in "up to primary" is more than 6 times the odds of a household with the respondent in "secondary and college" educational category.[18]

Figure 8.3: Diagram showing the relationship between father's occupation and educational level and his son's education and probability of falling below the poverty line.



Father's education is associated with father's occupation, but it does not have any significant direct effect on poverty independently of the other variables. It thus

[18] The lambda parameters are the logarithms of the odds and odds-ratio. Therefore, we can convert them into the relevant odds and odds-ratio by taking the exponential of the lambda parameters. Thus for example the $\lambda_{11}^{EP} = 1.8124$ corresponds to odds-ratio 6.12513 since $\exp(1.8124) = 6.12513$.

influences poverty through its association with father's occupation and respondent's educational level. Indeed, the father's educational level has a strong direct effect on his son's education. Thus the λ_{11}^{SE} equal to 2.0392 shows that the heads of household are more likely to be little-educated when they come from little-educated fathers than when they come from better-educated fathers. The corresponding odds-ratio shows that it is 7.68 times more likely for a son to have an "up to primary" education when the father has also an "up to primary" education than "secondary or college". In addition, father's occupation and educational level are associated. Fathers are less likely to have "up to primary" education when they are in occupation categories II and I than in category III (farmers). Thus if the father has "up to primary" education, the odds of him being in occupational category I are only 0.051 times the odds of him being in category III (farmer). Similarly, within the same educational level, the odds of him being in category II are 0.391 times the odds of him being a farmer.

Father's occupation is directly associated with the probability of the household being below the poverty line, independently of the other variables. Thus given a respondent's and his father's educational level, father's occupation affects the probability of a household being poor or not. The λ_{11}^{PO} = -0.8270 and λ_{12}^{PO} = -0.3261 denote that households with the father in occupational category II or I are less likely to be poor than the households in category III are. The corresponding odds-ratio shows that the odds of a household falling below the poverty line with the father in category I is only 0.437 times the odds of a household with the father in category III. Similarly, the relevant odds-ratio for those in category II is 0.721. Thus the household with a farmer father is 2.3 times more likely to be poor than the household with a father in category I and 1.4 times those with a father in category II, independently of

the other variables. Additionally, the fathers' occupation influences their sons' educational and thus it has an indirect effect on the probability of the household being poor. It is 0.271 times less likely for the respondent to have an "up to primary" education when the father's occupation is in category I than in category III. Similarly, the respondent with "up to primary" education is 0.356 times less likely, than a respondent with "secondary and college" education, to have a father in occupation category II than in category III. In other words, it is 3.69 times more likely for a respondent to have an "up to primary" education than "secondary and college" when his father is a farmer than when he is in category I.

8.5 Conclusions

This chapter examined the hypothesis that family background plays a significant role in determining the probability of being below the poverty line. The poverty line is considered to be a sharper indicator than income in investigating the influence of family background. The information used for defining the family of origin's socio-economic status is the education and occupation of the father of the head of household. Although simple cross-tabulations show the influence of the particular parental characteristics on respondents' attributes, we made use of loglinear analysis in order to uncover the potentially complex relationships among those variables.

The analysis shows that the background of the family of origin is related with the probability of the household falling below the poverty line. More specifically, the education of the respondent seems to be a particularly strong predictor of poverty.

Father's education is associated with father's occupation, but it does not have any significant direct effect on the respondent's poverty independently of the other variables. Father's education is, however, a strong predictor of respondent's education and is associated with the father's occupation. The probability of a respondent having little education is significantly higher if his father has had little education too. Father's education does not influence the respondent's probability of falling below the poverty line directly, but it does so indirectly, through the significant effect on respondent's education and the association with father's occupation. Father's occupation has a strong direct effect on respondent's poverty independently of the other variables. Households with respondents' fathers who were professionals, administrative executives, clerical, tradesmen or salesmen are less likely to fall below the poverty line in comparison with those whose fathers were craftsmen, labourers or service workers, and considerably less likely than those with fathers who were farmers. In addition, father's occupation has an indirect effect on poverty through the association with the respondent's education.

The above results show a clear causal relation between particular parental characteristics and respondent's attributes. Differences in family background result in people facing unequal opportunities for education and unequal probabilities of falling below the poverty line. This, of course, raises the question concerning the efficacy of educational reforms alone for reducing inequality and poverty. These results suggest that there is continuity in poverty and economic inequality across generations.

CHAPTER NINE

CONCLUSIONS AND POLICY IMPLICATIONS

The main objective of the present study was to systematically analyse income inequality in Greece, investigating aspects that have not or have only partially been explored so far and using a more comprehensive and appropriate database than those used by other relevant studies in the past. A brief review of such studies conducted previously showed that Greece, one of the poorest countries in the EU, has also a poor reputation as far as systematic research into issues related to social and economic inequality is concerned. Since the mid 1980s, research activity in this area has, fortunately, gained pace. Nevertheless, most of the studies conducted have failed to offer a clear picture of the inequality in Greece, while the estimates presented have often been unsuitable for comparative purposes or even inaccurate. In other cases, studies have treated the investigation of inequality as a secondary objective, so that the relevant estimates and summary measures on inequality presented were a by-product of their analysis. In fact, only a few studies have attempted a systematic analysis on issues related to social and economic inequality in Greece. No doubt that the lack of reliable statistical data and information has set serious limitations to these attempts.

More specifically, the vast majority of the relevant studies on inequality and poverty have been based on Family Expenditure Surveys (FES) and Tax Returns (TR). Our review pinpointed the fact that both databases have certain drawbacks, which constitute significant barriers to analysing certain aspects of social and economic inequality in Greece. FES are infrequently conducted and, in general, they have failed to offer reliable and detailed information on household income. The use of TR seems even more problematic due to the low population coverage and the high tax evasion. One can observe that, often, estimates and summary measures quoted by studies based on these data sources - TR in particular - not only vary significantly between them, but also fail to reach a consensus on the observed fluctuation of inequality in the course of time. Limited use has been made of the data collected during the two important sample surveys conducted by the National Centre for Social Research (EKKE), specially designed to gather detailed information on a variety of issues on economic and social inequality. Lack of necessary funds, bureaucratic reasons, and the fact that the necessary data organisation and cleaning never took place, are factors responsible for the fact that the full data sets of these two EKKE surveys are not presently available.

Our review exposed also the need for accurate and comparable estimates on issues related to income inequality in Greece. To achieve this one would need to utilise more comprehensive and appropriate data than that used by relevant studies in the past. Given the previous point, and given that detailed and accurate information is crucial for researchers and policy makers alike to define the population needs and identify priorities for interventions, certain choices were made when initiating the present study. Perhaps the most important was the utilisation of the information provided by

EKKE's latest sample survey. In arguing that an in-depth analysis of dimensions of social and economic inequality that were never or only partially investigated in the past was needed, we were aware that use of this database would be essential for such a task. Among the aspects candidate for analysis, we singled out the decomposition of inequality by income source and by certain population subgroups, the role of the family background in intergenerational transmission of inequality, and the distributional impact that certain government policies have on the actual distribution of household income. The investigation of these issues became part of the objectives of the present study.

Certain theoretical and methodological issues that one faces in analysing and assessing inequality were clarified, and related to the central question: "inequality of what?" The discussion brought to the surface the dual nature of the concept of inequality, as descriptive and prescriptive, a nature that affects any analysis. It was strongly argued that we could never have a value free meaning of economic inequality. Any adopted concept and definition in an inequality exercise cannot but introduce certain value judgements, so that each such concept and definition refers to a normative concept of "equality" associated with a particular school of thought. Taking this approach also means that the focusing on certain variables in the analysis of inequality is far from neutral. It is directly associated with the particular theoretical framework and tasks of each analysis. It follows that, the objectives chosen, the research questions posed, the hypothesis tested and the methodology selected in each study are largely and inevitably determined by the concept of inequality adopted, even if that is not always clearly stated. The dual nature of the concept of inequality is also mirrored in the used measures. Each of the proposed inequality measures introduces,

explicitly or implicitly, certain value judgements and refers to a certain concept of social welfare. Again, it follows that, in any empirical investigation, the use of certain inequality measures does not necessarily reflect the inequality in a way that is more coherent, but it often reflects a particular aspect of a normative comparison based on certain objective features.

Obstacles in analysing inequality were additionally found in connection to the concepts and variable definitions adopted during the empirical investigation, under the restrictions imposed by the availability of statistics. The relevant discussion focused on the economic variable, the length of time for income to be measured, the demographic unit of analysis, and the way in which certain units of different size and composition can be compared. It was shown that a number of alternative concepts and definitions could be used, each referring to a particular meaning of inequality and focusing on distinctive aspects. The adoption of different definitions and concepts could significantly alter the results of any investigation and meet different needs for comparisons. The policy implications are apparent. Different concepts and variable definitions could have a large effect on defining needs and targeting groups, on implementing certain policies, as well as on assessing the consequences of these policies.

The analysis and questions that emerged from the above reviews provided the framework for developing the methodology, the concepts, and the variable definitions of the present study. Among the aspects investigated were the impact of the alternative equivalence scales on the observed inequality, the information on the income structure in assessing and understanding some aspects of the distribution of

income, the use of different income concepts in exploring the distributional impact of certain government policies, and the use of alternative inequality measures in capturing particular aspects of the issue.

The present study utilised the micro-data of the latest (1988) of the two special sample surveys conducted by EKKE, designed to collect accurate information for measuring social and economic inequality in Greece. This survey was part of the Second European Anti-Poverty Programme. As previously mentioned, only limited use of the data provided by that survey had taken place by the time the present study was completed. Furthermore, the "cleaning" and organising of the total data had not taken place and, on top of that, the largest part of the original data was found missing in 1995. Therefore, in order to conduct the present study, a systematic investigation had to be undertaken and specific merging techniques had to be employed in order to discover and retrieve those parts of the original data that were crucial for constructing the necessary variables. This work allowed us to provide more accurate estimates on household income and on a number of other individual and social characteristics that are not subject to commonly encountered drawbacks, at least not to the same degree.

The design of the 1988 survey and the type of information collected had been primarily influenced by the objectives, as well as the concepts and variable definitions adopted by the EC project. Obviously, this posed restrictions and limitations to the present study. Although one could easily detect the similarities, an expected result of this influence, there were also a number of differences between the present study and the EC project, regarding the concepts adopted and the methodology followed in the analysis of inequality. Apart from the above differences, our review also highlighted

differences between the present study and other similar studies in the field. Of course, in order to improve the potential comparability of the results and to allow a further investigation into a number of issues related to inequality in Greece, the concepts and methodology used by other researchers and data archives had to be taken into consideration. In particular, special attention was paid to the concepts and definitions of household income, since providing accurate estimates of well-being and economic status was among the aims of this study. Alternative concepts and certain income components were used in order to investigate certain dimensions and allow for a more in-depth analysis. The concepts of income used in this analysis were the total disposable household income and the household income after taxes and social security contributions. Estimates were also provided on the contribution of certain individual income sources to before taxes and social security contributions household income, since it was shown that accurate estimates on the distribution of disposable income between sources in Greece were impossible to make. The goal was to avoid the drawbacks of the relevant estimates provided by the EC project for Greece. In addition, the estimates on disposable income provided by this study vary from those of the EC project for Greece, due to the different methodology adopted in calculating this variable, and due to the additional cleaning of the micro-data. All income components were calculated on an annual basis and refer to the year 1988. The demographic unit of analysis was considered to be the household, while an equivalence scale, providing different weights for adults and children, and imposing economies of scales in consumption, was used in order to make households with different composition comparable.

One of the aims of this study concerned the sensitivity of our results to the measure of income used in assessing inequality in Greece. The analysis showed that the alternative scales used for making households of different sizes and composition comparable may not have any significant effect on certain aggregate inequality indices. By contrast, they do affect greatly the rank order of each particular household in the distribution, with apparent policy implications. It thus seems that the design, evaluation, and implementation of a number of policies, such as direct taxation and social security, would be affected significantly by the equivalence scale used in assessing inequality. Overall, equivalent household income (OECD scale) appeared slightly more equally distributed than per capita and total (non-equivalent) income.

Income inequality in Greece was initially investigated using an analysis by income source. The aim was to provide suitable additional information on the structure and the profile of income inequality in Greece. The analysis by deciles showed that the contribution of each individual source to gross household income appeared to vary significantly between income deciles. The average share of wages and salaries increases gradually with total household income, with the exception of the tenth of the richest population. By contrast, rural and social security income gradually reduces their average shares as total household income rises (the only exception being the share of rural income of the richest tenth). More than half of the total entrepreneurial income is concentrated in the households of the richest decile. The aggregate share of entrepreneurial income did not seem to follow any clear pattern in the rest of the deciles.

The decomposition analysis of inequality by income source provided us with additional valuable information for further examination of the observed inequality. It was clearly shown that entrepreneurial income makes by far the most significant contribution to overall inequality, despite the fact that it represents a relatively small fraction of the overall income. All of these tend to suggest that, the most effective way to eventually reduce inequality is by reducing the inequality of entrepreneurial income. By contrast, wages and salaries, despite them being the most important source of income, are considerably less significant contributors to overall inequality. Comparing these findings with those of other studies in other countries, the importance of entrepreneurial income as a contributor to overall inequality in Greece was emphasised.

These results can serve as a guide for evaluating the potential effect that particular government policies have on income inequality. The results could help policy makers to decide on more effective policies for reducing inequality, and to improve their tools for evaluating and predicting the potential implications that other government policies or actions might have on income inequality, poverty and, consequently, on social development. In particular, the decomposition analysis by income source may facilitate the establishment of links between the functional and personal income distribution in Greece, leading to significant policy implications. The sources in which household income is decomposed in this analysis could allow a comparison with the relevant macroeconomic figures and, in particular, with those of the National Accounts. Assuming that any increase to the income of a source K would be distributed in the same way as the rest of the income from the same source, the above results could provide the necessary framework for evaluating the potential

implications of certain government policies (eg. growth policies) on overall inequality. Thus any increase of the share that the entrepreneurial income has in the total income would result in a significant increase in overall inequality. By contrast, an absolute increase of the total wages and salaries, while everything else remained unchanged, would cause a decrease in the share of entrepreneurial income in total household income, and thus would result in a reduction of overall inequality. Similarly, an increase in unemployment would not only reduce the share of wages and salaries, but would probably increase the proportional contribution of entrepreneurial income to total income. Therefore, overall inequality would probably increase not only due to the growth of inequality in wages and salaries, but also due to the effect that the increased share of entrepreneurial income would be expected to have.

Lack of available data in Greece has restricted this analysis to the use of income data for only one year. A decomposition analysis by source of income for time-series data would have allowed us to investigate in more detail the effect that changes in particular macroeconomic figures have on income inequality. It would have thus permitted more precise predictions and evaluations of the implications that a number of government policies - particularly those which are aiming to the growth of certain macroeconomic indicators - would have on income inequality and, consequently, on poverty and social development. This is an area in need for further investigation. It is important that more detailed time-series data be collected for future use.

The analysis by income source provided also some evidence on the distributional impact of income tax and social security contributions, which was among the main aims of the present study. Despite the progressive income taxation that has been

imposed by the Greek legislation, the after-tax and social security contributions to household income appeared more equally distributed than gross income, but only marginally. The tax and contribution evasion appears to be mainly associated not with the total income, but with the structure of income, as far as the contribution of each individual source is concerned. The household groups with high average shares of wages and salaries in total income also pay a high average percentage of taxes and contributions. Tax evasion appears to be higher among incomes from entrepreneurial activities. Thus, the weak distributional impact of income tax and social security contributions is mainly attributed to tax evasion in Greece, mostly linked to entrepreneurial activities.

The distributional impact of income taxes and social security contributions is limited mostly to reducing the inequality of wages and salaries, as revealed by the decomposition analysis of inequality by income source. Without structural changes of the current tax system, an increase of tax rates would only marginally contribute to the reduction of overall inequality. In fact, these findings point to reasons why the Greek system of income tax and social security contributions is ineffective in reducing inequality. The findings point also to the importance of redesigning or reforming the current tax system in Greece, so that it becomes effective enough to eliminate the tax and contribution evasion, observed mainly among the recipients of entrepreneurial income. Such elimination would help the system achieve its distributional goals and would be the most efficient - if not the only way - to do so.

Overall, the analysis of inequality by income source tends to suggest that the reduction of the inequality of entrepreneurial income appears to be the most effective

way to reduce total inequality in Greece. It follows that, a simple increase of tax rates, under the current structure of the Greek tax system, would mainly affect the incomes from wages and salaries. Therefore, the contribution of net income from wages and salaries to total disposable household income would be negatively affected. Depending on the progressiveness of taxes and social security contributions, this could also lead to a further decrease in the inequality of net wages and salaries. This decrease would only have a marginal impact on the overall inequality of the disposable income.

The close relationship between the taxes and social security contributions and the various income components were further explored by employing regression analysis. A number of aspects were investigated using a database that was more secured from the usual drawbacks of those used so far. The percentage of taxes and social security contributions appeared to be strongly associated only with the percentage of wages and salaries to household income. None of the other sources of income (as shares of total household income) or the total income alone were found to have a significant association of any type with the percentage of taxes and contributions.

The analysis of the distribution of taxes and social security contributions by total household income for those groups of households with more than 95% of income deriving from one of the main sources of income, provided more explicit evidence on this issue. The group of households the income of which is mainly attributed to wages and salaries appeared to pay significantly higher percentages for taxes and social security contributions than the other groups. It was also the only group where these percentages appeared to be generally progressive. The regression analysis showed that

almost 80% of the variation of taxes and contributions in this household group could be explained by the variation of total income. By contrast, these variables did not indicate any similar strong association of any type for other groups of households. Those households with more than 95% of income deriving from rural activities pay literally nothing for taxes and social security contributions. This is because the special taxes and contribution allowances for these latter households that were introduced in the past still hold, even though they are not considered as poor as they used to be. The households in the "social security income" group pay on average for taxes and social security contributions less than half of the percentage that households in the "wages and salaries" group pay. Except for "the wages and salaries" group, the "social security income" group was the only other group of households where there was a strong association between total income and taxes and social security contributions. The variation of total income in the "social security income" group explains alone more than 50% of the variation of taxes and social security contributions. Finally, the households the income of which is mainly attributed to entrepreneurial activities appeared to pay a surprisingly low average percentage for taxes and social security contributions. This figure represents only one third of the relevant figure for the "wages and salaries" group and almost half for total households. The distributions of taxes and social security contributions in this group do not show a significant association of any type with total income. This is the group in which the highest tax evasion is observed. In particular, among the households of this "entrepreneurial income" group, particularly skilled at tax and contribution avoidance were those with the highest income.

The results of this latter analysis outline the area for National and EU policy actions and interventions, since they offer novel and valuable information for appraising and evaluating the performance of income taxes and social security contributions, in respect to a number of social and economic issues. They can, therefore, be particularly important for the design and implementation of tax and social security policies in Greece. They particularly point to the necessity of redesigning or reforming the current tax and social contribution system so as to maximise its effectiveness in achieving its distributional goals. The elimination of tax evasion (and tax avoidance), mainly among the recipients of entrepreneurial income, has to be the main priority. Additional research needs to be carried out to explore in a more detailed fashion various aspects related to the distributional impact of income tax and social security contributions. Furthermore, the aim of uncovering the distributional effect of other government policies and interventions, such as the indirect taxation, the various social security provisions and services and so on, needs to be placed high on the research agenda.

Drawing the profile of inequality in Greece, the influence of certain population characteristics was also analysed. Income differences were investigated between certain population subgroups, formed according to particular general characteristics of the household such as size, composition and degree of urbanisation, and according to certain attributes of the head of household such as education, age and occupation. Emphasis was given not only to the average total household income, but also to the differences in the synthesis of household income as far the contribution of each individual source is concerned. The analysis revealed that the average household income is, indeed, affected significantly by certain characteristics of the unit of

analysis. The analysis by income source showed that there are also disparities in the structure of household income between different subgroups, and helped us gain more insight into income differences. It also shed more light on household characteristics and assisted the understanding and explanation of certain differences between population subgroups. From a policy perspective, this information is crucial for evaluating, as well as for formulating and implementing efficient policy interventions related to inequality and poverty.

For policy makers, it is very important to know the extent to which the overall inequality is attributable to inequality between these subgroups and the extent to which it is attributable to inequality within them. In Greece, few have paused to consider the implications of such a distinction. In beginning to investigate this issue, we decomposed inequality into within-group and between-group components. A number of alternative indices were used to capture the different aspects of the inequality and to serve as a test for the robustness of the estimates in the decomposition exercise.

Income inequality was found to vary significantly among different population subgroups. Additionally, the decomposition analysis showed that, in all the groups used the between-group inequality accounts only for a very small segment of the overall inequality. In particular, the analysis according to the degree of urbanisation revealed that no more than 5.3% of the overall inequality is attributable to the between-group component. The relevant figure for the inequality between regions is 4.2%. This estimate is even lower for the group formed according to the age of the head of household. By contrast, the highest estimate on the between-group

component, with 7.3-13.4%, was found in the groups formed according to the educational level of the head of household. In the groups formed based on the occupational status of the head of household, there also appeared to be a relatively high contribution of the between-group components to overall inequality. The most striking implication is that any attempt to eliminate the between-group inequality, but leave the within-group inequality unchanged would not have any significant effect on the aggregate inequality. Simply put, any policy that is not targeted at reducing inequality within each of the above household groups would be condemned to have a limited impact on reducing overall inequality.

Finally, the introduction of a more dynamic approach for analysing inequality in Greece, reinforced by the investigation into certain intergenerational aspects, was among the principal objectives of the present study. The hypothesis that family background plays a significant role in determining the probability of being below the poverty line was tested. The poverty line was considered to be a sharper indicator than income in investigating the influence of family background. The information used for defining the family of origin's socio-economic status was the education and occupation of the father of the head of household. Although simple cross-tabulations showed the influence of the particular parental characteristics on the respondents' attributes, we made use of loglinear analysis in order to expose the potentially complex relationships among those variables.

The analysis showed that the background of the family of origin is related to the probability of the household falling below the poverty line. More specifically, the education of the respondent seems to be a particularly strong predictor of poverty.

Father's education is associated with father's occupation, but it was not found to have any significant direct effect on the respondent's poverty independently of the other variables. Father's education is, however, a strong predictor of respondent's education and is associated with the father's occupation. The probability of a respondent having little education is significantly higher if his father has had little education also. Father's education does not influence the respondent's probability of falling below the poverty line directly, but it does so indirectly, through the significant effect on respondent's education and the association with father's occupation. Father's occupation has a strong direct effect on respondent's poverty independently of the other variables. Households with respondents whose fathers were professionals, administrative executives, clerical, tradesmen or salesmen were less likely to fall below the poverty line compared to those whose fathers were craftsmen, labourers or service workers, and considerably less likely than those whose fathers were farmers. In addition, father's occupation has an indirect effect on poverty through the association with the respondent's education.

All these results showed a causal relation between particular parental characteristics and respondent's attributes. It appears that differences in the family background result in people facing unequal opportunities for education and unequal probabilities of falling below the poverty line. This, of course, raises a question concerning the efficacy of educational reforms alone in reducing inequality and poverty. The results of this analysis suggest that there is continuity in economic inequality across generations. This area has attracted hardly any research interest in Greece, mainly due to lack of sufficient statistical information on the subject. The present results open the prospects for further research into this issue, based on more detailed information

related to the social and economic status. Further research is needed in order to improve our knowledge on the mechanism through which one's current socio-economic status is affected by particular characteristics and attributes of the family of origin. Appropriate time-series, and, in particular, longitudinal data is necessary, as it would allow a more in-depth investigation into the way and the extent to which economic and social status is transferred from one generation to the next.

APPENDIX I

Distribution of Per Capita Disposable and Gross Household Income from Various Sources and Taxes and Social Security Contributions by Income Deciles.

DECILES	SOURCES OF INCOME								Average Total Income	Taxes & Soc. Secur. Contrib.	Average Dispo-sable Income
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources			
					Pensions	Other Trans.	Total				
a. Means (in .000 drachmas per year).											
1	*18*	*12*	*2*	*35*	*42*	*2*	*44*	*4*	***115***	4	111
2	*60*	*24*	*3*	*52*	*54*	*3*	*57*	*14*	***210***	11	199
3	*98*	*40*	*11*	*45*	*73*	*1*	*74*	*16*	***285***	21	264
4	*108*	*55*	*7*	*58*	*86*	*2*	*88*	*30*	***345***	23	322
5	*167*	*55*	*9*	*69*	*91*	*1*	*92*	*25*	***416***	37	378
6	*200*	*77*	*11*	*50*	*120*	*2*	*122*	*29*	***491***	48	443
7	*215*	*78*	*23*	*69*	*149*	*1*	*151*	*47*	***583***	55	528
8	*318*	*100*	*27*	*42*	*184*	*2*	*187*	*36*	***710***	81	629
9	*440*	*117*	*50*	*81*	*170*	*3*	*173*	*51*	***911***	108	803
10	*551*	*615*	*104*	*179*	*247*	*2*	*249*	*36*	***1733***	189	1544
TOTAL	***218***	***117***	***25***	***68***	***122***	***2***	***124***	***29***	***580***	**58**	**522**
b. Means as percentage of total gross (per capita) household income in each row.											
1	*15.2*	*10.8*	*1.8*	*30.2*	*36.7*	*1.9*	*38.6*	*3.5*	***100.0***	3.7	96.3
2	*28.7*	*11.7*	*1.2*	*24.7*	*25.7*	*1.4*	*27.1*	*6.6*	***100.0***	5.1	94.9
3	*34.5*	*14.1*	*3.9*	*15.8*	*25.5*	*0.4*	*26.0*	*5.7*	***100.0***	7.4	92.6
4	*31.4*	*15.8*	*2.1*	*16.7*	*24.9*	*0.6*	*25.4*	*8.6*	***100.0***	6.7	93.3
5	*40.1*	*13.1*	*2.1*	*16.7*	*21.8*	*0.3*	*22.1*	*5.9*	***100.0***	9.0	91.0
6	*40.8*	*15.8*	*2.3*	*10.2*	*24.5*	*0.4*	*24.9*	*6.0*	***100.0***	9.8	90.2
7	*36.8*	*13.4*	*3.9*	*11.9*	*25.6*	*0.2*	*25.8*	*8.1*	***100.0***	9.4	90.6
8	*44.8*	*14.1*	*3.8*	*6.0*	*26.0*	*0.3*	*26.3*	*5.0*	***100.0***	11.4	88.6
9	*48.3*	*12.8*	*5.5*	*8.9*	*18.7*	*0.3*	*19.0*	*5.6*	***100.0***	11.8	88.2
10	*31.8*	*35.5*	*6.0*	*10.3*	*14.2*	*0.1*	*14.4*	*2.1*	***100.0***	10.9	89.1
TOTAL	**37.5**	**20.2**	**4.3**	**11.7**	**21.0**	**0.3**	**21.3**	**5.0**	**100.0**	**10.0**	**90.0**
c. Means as percentage of relevant total (per capita) household income from each source.											
1	*0.8*	*1.1*	*0.8*	*5.1*	*3.5*	*11.0*	*3.6*	*1.4*	***2.0***	*0.7*	2.1
2	*2.8*	*2.1*	*1.1*	*7.6*	*4.4*	*14.9*	*4.6*	*4.8*	***3.6***	*1.9*	3.8
3	*4.5*	*3.4*	*4.5*	*6.6*	*6.0*	*6.4*	*6.0*	*5.7*	***4.9***	*3.6*	5.0
4	*5.0*	*4.7*	*3.0*	*8.5*	*7.1*	*9.8*	*7.1*	*10.3*	***6.0***	*4.0*	6.2
5	*7.7*	*4.7*	*3.5*	*10.2*	*7.4*	*6.0*	*7.4*	*8.6*	***7.2***	*6.5*	7.2
6	*9.2*	*6.6*	*4.6*	*7.4*	*9.9*	*10.8*	*9.9*	*10.2*	***8.5***	*8.3*	8.5
7	*9.9*	*6.7*	*9.3*	*10.2*	*12.3*	*6.5*	*12.2*	*16.5*	***10.1***	*9.5*	10.1
8	*14.6*	*8.5*	*11.1*	*6.2*	*15.2*	*11.8*	*15.1*	*12.5*	***12.3***	*14.0*	12.1
9	*20.2*	*9.9*	*20.2*	*11.9*	*14.0*	*13.3*	*14.0*	*17.7*	***15.7***	*18.7*	15.4
10	*25.3*	*52.4*	*42.0*	*26.4*	*20.3*	*9.6*	*20.1*	*12.4*	***29.9***	*32.7*	29.6
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Note: Deciles ranked by per capita gross household income.

APPENDIX II

Distribution of Total (Non-Equivalent) Disposable and Gross Household Income from Various Sources and Taxes and Social Security Contributions by Income Deciles.

DECILES	SOURCES OF INCOME								Average Total Income	Taxes & Soc. Secur. Contrib.	Average Dispo-sable Income
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources			
					Pensions	Other Trans.	Total				
a. Means (in .000 drachmas per year).											
1	37	11	9	69	105	4	109	37	**273**	9	264
2	52	47	12	95	254	5	259	74	**539**	24	515
3	165	86	14	156	251	7	258	71	**750**	41	709
4	302	149	26	145	285	7	292	55	**969**	66	903
5	579	139	43	139	247	8	254	49	**1202**	121	1082
6	694	203	40	147	303	4	307	48	**1440**	156	1283
7	821	257	62	273	237	6	243	47	**1702**	180	1522
8	980	405	70	285	269	11	280	42	**2063**	232	1831
9	1351	473	110	221	336	7	343	87	**2585**	326	2259
10	1480	1864	251	650	413	7	420	47	**4712**	488	4224
TOTAL	**646**	**363**	**64**	**218**	**270**	**7**	**277**	**56**	**1624**	**164**	**1459**
b. Means as percentage of total gross household income in each row.											
1	13.5	4.2	3.4	25.4	38.5	1.4	39.9	13.6	**100.0**	3.4	96.6
2	9.7	8.6	2.3	17.6	47.2	0.9	48.1	13.7	**100.0**	4.4	95.6
3	22.0	11.4	1.9	20.8	33.4	1.0	34.4	9.4	**100.0**	5.5	94.5
4	31.1	15.4	2.7	15.0	29.4	0.7	30.1	5.7	**100.0**	6.9	93.1
5	48.1	11.5	3.6	11.6	20.5	0.7	21.2	4.1	**100.0**	10.0	90.0
6	48.2	14.1	2.8	10.2	21.0	0.3	21.3	3.3	**100.0**	10.9	89.1
7	48.2	15.1	3.7	16.0	13.9	0.3	14.2	2.7	**100.0**	10.6	89.4
8	47.5	19.6	3.4	13.8	13.1	0.5	13.6	2.1	**100.0**	11.2	88.8
9	52.3	18.3	4.2	8.5	13.0	0.3	13.3	3.4	**100.0**	12.6	87.4
10	31.4	39.6	5.3	13.8	8.8	0.1	8.9	1.0	**100.0**	10.4	89.6
TOTAL	39.8	22.4	3.9	13.4	16.6	0.4	17.0	3.4	**100.0**	**10.1**	**89.9**
c. Means as percentage of relevant total household income from each source.											
1	0.6	0.3	1.5	3.2	3.9	5.9	3.9	6.7	**1.7**	0.6	1.8
2	0.8	1.3	1.9	4.3	9.4	7.7	9.4	13.2	**3.3**	1.4	3.5
3	2.6	2.4	2.3	7.2	9.3	11.3	9.3	12.7	**4.6**	2.5	4.9
4	4.7	4.1	4.1	6.7	10.5	10.8	10.5	9.9	**6.0**	4.0	6.2
5	9.0	3.8	6.7	6.4	9.1	12.0	9.2	8.8	**7.4**	7.3	7.4
6	10.7	5.6	6.3	6.7	11.2	6.3	11.1	8.6	**8.9**	9.5	8.8
7	12.7	7.1	9.8	12.5	8.8	8.7	8.8	8.4	**10.5**	10.9	10.4
8	15.2	11.1	11.0	13.1	10.0	16.5	10.1	7.6	**12.7**	14.1	12.5
9	20.9	13.0	17.2	10.1	12.5	10.4	12.4	15.6	**15.9**	19.8	15.5
10	22.9	51.3	39.2	29.8	15.3	10.4	15.2	8.5	**29.0**	29.7	28.9
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Note: Deciles ranked by total (non-equivalent) gross household income.

APPENDIX III

Selection of the Model Fitted to Data Using Backward Elimination in the Loglinear Analysis of Chapter 8.

The backward elimination starts with a hierarchical model (or the saturated model) and then removes - step by step - all the effects that result in the least significant change in the likelihood-ratio chi-square (Norusis 1994, Gilbert 1993). In order to fit the best model, variable selection algorithms are used, based on log likelihood ratio (G^2) statistics.[1]

Model	G^2	DF	p
[PES][PEO][PSO][ESO]	3.35020	2	0.187
[PEO][PSO][ESO]	3.35011	3	0.341
[PEO][ESO][[PS]	3.45004	5	0.629
[PEO][ESO]	3.78627	6	0.706
[ESO][PE][PO]	5.41233	8	0.713
[PE][PO][SO][ES][EO]	9.52636	10	0.483

[1] SPSS Model Selection Loglinear Analysis is used for the backward selection (Norusis 1994).

The best fitting model is the [PE] [PO] [SO] [ES] [EO], which includes all the two pair associations and the lower order relatives except the association between [SP]. The model fits very well with a G^2 = 9.52636 at 0.483 significance level. Thus the selected model that fits the data is the following:

$$\log m_{ijkl} = \mu + \lambda_i^P + \lambda_j^E + \lambda_k^S + \lambda_l^O + \lambda_{ij}^{PE} + \lambda_{il}^{PO} + \lambda_{jk}^{ES} + \lambda_{jl}^{EO} + \lambda_{kl}^{SO}$$

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